ABSTRACTS

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ABSTRACTS

(The titles which are set in bold-face are intended as "scanning titles" for ease in classifying and filing. Where these are not substantially the authors' titles the exact titles are set in parentheses.)

1—FIBRES AND THEIR PRODUCTION

(B)—ANIMAL

Sheep: Studies of Comparative Fleece Growth. I. The Quantitative Nature of Inherent Differences in Wool-growth Rate. K. A. Ferguson, H. B. Carter and M. H. Hardy. *Australian J. Sci. Research*, 1949, Series B, **2**, 42-81. In order to test the applicability of the law of diminishing returns, and of an equation derived from it, to the relation of rate of wool growth to nutrient intake, 12 Camden Park Merinos and 12 Corriedales individually fed were each divided into three groups of 4 sheep, one group being kept at a uniform intermediate plane of nutrition throughout, one group being transferred in four stages of six weeks' duration from a high to a low plane, and one group transferred in four similar stages from a low to a high plane of nutrition. Equilibration periods of not less than 12 weeks were spent at the highest and lowest planes of nutrition before and after the reciprocal transfers were made. The diet used was of constant composition throughout. Data from the groups maintained at a uniform plane of nutrition revealed that factors other than the plane of nutrition were causing significant fluctuations in rate of wool growth which required assessment before the main issues could be examined. Rate of wool growth was found to have a significant positive association with the environmental air temperature, and evidence suggested that the change in rate of wool growth per °F. increased with the plane of nutrition. It was postulated that the temperature effect was mainly due to cutaneous blood circulation changes which form part of the normal heat regulating response of the body. Data from the uniform groups showed that a mean reduction in fibre cross-sectional area occurred with growth increase in fleece weight. Considerations of tissue hydrostatic pressure were also invoked to explain why the effect of temperature on rate of wool growth was almost wholly brought about by an effect on length-growth rate in contrast to the effect of the plane of nutrition on both fibre thickness and length-growth rate. W—**1B.**

Wool Fibres: Relaxation of Stress. S. M. Katz and A. V. Tobolsky. *Text. Res. J.*, 1950, **20**, 87-94. The decay of tension of Columbia 56s wool fibres maintained at constant temperature and extension in water, in sodium bisulphite solutions of various concentrations, and in neutral salt solutions was measured. The results obtained in water are similar to those of Speakman and Shah for human hair. The addition of sodium bisulphite causes a rapid decay in the stress of stretched wool, apparently due to a chemical reaction involving the cystine linkages. At high concentrations the rate is independent of bisulphite concentration. A slower but large stress decay occurs in the presence of neutral salts, *e.g.* sodium chloride. W—**1B.**

Wool Keratin: Chemistry. *Wool Science Review*, 1950, No. 5, 32-45. The article consists of a general review of the chemistry of wool keratin, including the chemical constitution and chemical treatment of wool. W—**1B.**

Wool Wax Constitution. S. H. Bertram. *J. Amer. Oil Chem. Soc.*, 1949, **26**, 9, 454-6. Extensive analyses have been made of American and Australian wool waxes. Combined hydroxy acids have been shown to be the most characteristic and important components of these waxes. Both contained considerable amounts (about 91·5 per cent. in the case of the American wax and 31·7 per cent. in the Australian sample) of diestolidic esters of the alcohols of the unsaponifiable fraction. This conclusion is supported by calculations of composition, by obser-

vations of viscosity and emulsifying properties, and by determinations of mean molecular weight by the Prahl method. W—**1B.**

Wool Root Biochemical Studies. W. J. Ellis, J. M. Gillespie and H. Lindley. *Nature*, 1950, **165**, 545-548. The amino-acids present in aqueous or 70 per cent. ethanol extracts of wool roots have been identified by means of two-dimensional paper chromatography, and as their 2:4 dinitrophenyl derivatives on buffered silica columns. A considerable fraction of the sulphur in wool roots is in the sulphydryl form, and is present as peptides of high molecular weight or as protein. A number of organic acids were identified chromatographically in the extracts. A comparison of the copper content of wool roots and fibres showed that there is more copper in the root. Several enzyme systems have been also detected in wool roots. These include an alkaline phosphatase, pyrophosphatase, an active dehydrogenase system which is only partially extractable with water, a highly active catalase which can be extracted either by normal saline or by sonic disintegration in water, and an esterase which can hydrolyse simple esters, *e.g.* methyl butyrate. W—**1B.**

Wool Electron Microscopic Study. E. H. Mercer. *Proceedings of the Sixth International Congress of Experimental Cytology*, 60-62. An examination of the cortical cells resulting from the enzymic disintegration of wool fibres revealed both fibrous and amorphous components, and, by gold shadowing, it was observed that both fibrils and matrix were corpuscular. The arrangement of the corpuscles is discussed in relation to the fibre X-ray pattern. W—**1B.**

Modified Wool Fibres: Prevention of Supercontraction. A. E. Brown, J. H. Pendergrass and M. Harris. *Text. Res. J.*, 1950, **20**, 51-52. The supercontraction of wool modified with (*a*) hydrosulphite and ethylene dibromide, and (*b*) sodium sulphoxylate formaldehyde and methylene dibromide, is described. The modified fibres supercontracted less than 1 per cent. in each case, whereas the untreated fibres supercontracted almost 20 per cent. in (*a*) and 26 per cent. in (*b*). The addition of ethylene dibromide prevented supercontraction in boiling sodium bisulphite, and a possible explanation for this behaviour is suggested. The importance of the role of disulpide bond breakdown is stressed. W—**1B.**

Slipe Wools—Production, Marketing and Uses. H. C. Crossland. *Wool* (Massey College Wool Association), 1949, **1**, No. 2, 55-57. The production of slipe wools is discussed, and points requiring special attention are noted. Suggestions for improvements are made, and the necessity for a regular standard of production throughout the season is emphasised. Details are given of the four main types of slipes listed by the Wool Control, and special mention is made of the characteristics looked for by wool buyers. Reference to marketing methods is made. W—**1B.**

Wool: Technical Problems of the Producer. *Wool Science Review*, 1950, No. 5, 22-31. Factors affecting wool quality, including fibre diameter, length, tensile strength, handle, crimp, and hairiness, are discussed, and some diseases of sheep which affect wool (*e.g.* blow-fly strike, and diseases due to copper and cobalt deficiency) are mentioned. Breeding for fleece improvement and marking of sheep are briefly discussed. W—**1B.**

What is Wool? W. R. Lang. *Textile Journal of Australia*, 1949, **24**, 830-832. A report of a lecture includes a description, together with a classification, of wool fibres, and the effect on wool fibres of selective breeding in Australia. The structure of the epidermis is described. Reference is also made to wool scales, and to "temporary" and "permanent" set. W—**1B.**

Wool: Improvement of Properties by means of Synthetic Materials. ("Synthetics Open up New Fields of Usefulness for Wool.") R. G. Lund. *Wool* (Massey College Wool Association), 1949, **1**, No. 2, 7-9. Some of the recent developments in synthetic fibres and ways in which these may increase the usefulness of wool products are described. Synthetic materials may be used to improve the wool fibre characteristics by application either to the surface or to the inside of the wool fibres. W—**1B.**

Wool from Copper-starved Merino Sheep: Properties. R. C. Palmer. *J. Agricultural Science*, 1949, **39**, 265-273. The mean fibre length, mean fibre diameter, mean fibre crimp ratio (*i.e.* ratio of length of the fibre under 2·5 mg. load to its length stretched), and a quantity approximately proportional to the ultimate tensile fibre strength, have been measured for twenty-five skirted Merino fleeces

clipped from sheep that had been grazed at Robe (South Australia) on copper-deficient land and fed by mouth with amounts of copper varying from zero to 100 mg./day. Sulphur analyses and qualitative amino-acid analyses were carried out on some of the fleeces. The fleeces were processed one by one on the worsted system into yarn. The results show an increase in fibre diameter, an increase in ultimate tensile strength and an improvement in behaviour in processing with increasing dietary supplement of copper. W—**1B.**

Sheep Tracks in China. H. M. Sievwright. *Wool* (Massey College Wool Association), 1949, Vol. 1, No. 2, 41. The journey of 425 sheep by air from New Zealand to Chinese Central Asia is described. Factors to note in breeding with native Chinese sheep are given. Descriptions of the Chinese sheep and methods of shearing are included. Some economic problems, especially concerning grazing of sheep and clothing the native population are discussed, and attention is drawn to the fact that the wool is used for carpet production, while the natives are scantily clad. W—**1B.**

Sheep and Wool of South America. T. Reid. *Wool* (Massey College Wool Association), 1949, Vol. 1, No. 2, 15. A visit by the author to a South American estancia, 100 miles from Montevideo, on behalf of a New Zealand stud stock department is described. The conditions in Uruguay are discussed and a comparison is drawn with the sheep in New Zealand. The author was particularly impressed with wool from Patagonia and compares this favourably with Australian and New Zealand wool. W—**1B.**

New Zealand Wool Production: Trend. W. Pease. *Wool* (Massey College Wool Association), 1949, **1** No. 2, 23, 25. The fluctuations in the New Zealand clip from the time of the early settlers are described. The effect of fashion and the impact of the advent of refrigeration in 1882 leading to the production of dual-purpose sheep are cited as important factors, and the relationship between wool and meat production is discussed. Statistics concerning sheep population, numbers of bales of wool, *etc.*, are included. It is stated that the present trend of wool production is approaching a quality range of from 48s to 58s. W—**1B.**

Sheep in South Africa: History. W. L. Speight. *Merino Breeders' J.*, 1950, **12**, No. 1, 8-10. The history of sheep rearing in South Africa is briefly discussed, the influence of sheep imports and exports from Australia being emphasised. W—**1B.**

Fine Wool Merino in Tasmania: History and Development. R. R. Taylor. *Pastoral Rev.*, 1949, **59**, 952, 955, 1055-7. The history of the merino throughout the world from its first introduction into Spain is described, together with an outline of breeding policies in Tasmania since 1890. W—**1B.**

Sheep: D.D.T. for Protection against Blowfly Strike. R. du Toit and P. J. Goosen. *Onderstepoort J.*, 1949, **22**, 285-290. Sheep treated at Onderstepoort with emulsions containing 5 per cent. and 2·5 per cent. *para-para*-isomer of D.D.T. on selected sites on the fleece, and subsequently tested on these treated sites by artificially induced strikes with first-stage larvæ of blowflies, were protected for a period of approximately three months. A field experiment in which sheep were sprayed in the breech region with emulsions containing 6, 5 and 2·5 per cent. of the *p.p.*-isomer of D.D.T. showed that a considerable degree of protection was afforded. It is concluded that treatment with a D.D.T. emulsion containing 5 per cent. *p.p.*-isomer will afford a degree of protection sufficient to reduce blowfly strike to a minimum during the periods of greatest activity. W—**1B.**

Sheep: Comparison of Manchester Operation with Modification of Mules Operation in Prevention of Flystrike. F. H. W. Morley. *Agricultural Gazette of New South Wales*, 1949, **60**, 543-548; 571-575; 655-657. The Manchester operation is an effective means of blowfly control, but after considering the results of the experiments described it is concluded that the simpler and safer modified Mules operation combined with a tail operation is preferable, since this offers equal protection. W—**1B.**

Wool and Hairs: The Subcutis and other Cuticular Constituents. ("Die 'Subcutis' und andere kutikuläre Bestandteile von Wolle und Haaren.") E. H. Mercer, J. Lindberg and B. Philip. *Textilber.*, 1950, **31**, 32-35. This article also appears in *Text. Res. J.*, 1949, **19**, 678-685 (these Abs., 1950, A173). W—**1B.**

(C)—VEGETABLE

American Upland Cotton: Adaptation to Indonesia. ("Veredelingsmethoden bij katoen in de Verenigde Staten van Noord-Amerika.") *Landbouw*, 1948, **20**, 85-93 (through *Plant Breeding Abstr.*, 1949, **19**, 345). The objectives of cotton breeding are reviewed. American Upland cotton is sufficiently variable to make it adaptable to very different environments. Crossing with indigenous varieties in Indonesia should lead to a strain with staple length about one inch. C—**1C.**

Cotton: Cultivation in Nigeria, 1947. *Ann. Report Agric. Dept. Nigeria, 1947*, 16-17, 38-39, 56, 63, 74-78. (Published 1949.) Accounts are given of cotton yields, insect damage, and selection work in Nigeria in 1947. Figures are tabulated showing the amount of cotton ginned for export in the Western Provinces in the years 1937-1947. Data on cotton marketing and cotton grading are also presented. C—**1C.**

Belgian Congo Cotton: Breeding. ("Note sur la technique de la sélection du cotonnier.") *C. r. Semaine Agric. Yangambi*, Part I; *Publ. Inst. Nat. Agron. Congo Belge*, 1947; *Hors Séries*, 529-537 (through *Plant Breeding Abstr.*, 1949, **19**, 346). An account is given of pedigree selection of cotton in the Belgian Congo, starting with (1) a natural population, and (2) the progeny of a cross between different species or varieties. C—**1C.**

Hybrid Cottons: Development. ("Hybrid vigor from natural crossing for improving cotton production.") D. M. Simpson. *J. Amer. Soc. Agron.*, 1948, **40**, 970-979 (through *Plant Breeding Abstr.*, 1949, **19**, 346). Relatively pure seed of seven varieties of cotton was planted for comparison with seed of the same varieties that had been produced by open pollination in a previous variety test comprising 25 varieties of Upland cotton. The excess yield of the "crossed" seed over that of the pure varieties ranged from 5·7 to 44·2 per cent., av. 15·4 per cent. The crossed seed produced larger bolls and seeds and higher lint indices. Two methods for taking advantage of natural crossing are suggested. There is evidence that natural crossing may reach 50 per cent. C—**1C.**

Peruvian Cotton: Production. G. E. Nicholson. *Inst. Inter-Amer. Affairs, Peru*, 1948, 58 pages (mimeo.) (through *Plant Breeding Abstr.*, 1949, **19**, 345). This report reviews the classification of world cottons, the origin and distribution of wild and cultivated cottons in the Old and New Worlds, the characters of *G. barbadense* and the Peruvian cottons, the origin of Tanguis cotton, cotton growing in Peru (including history), and the development of improved strains. Maps are included. C—**1C.**

Cotton Plant: Effect of N, P and K Nutrients on Lint and Seed Properties. W. L. Nelson. *Agron. J.*, 1949, **41**, 289-293 (through *Chem. Abstr.*, 1949, **43**, 8592^{f}). A marked increase in yield was obtained from the application of N and K on a very fine sandy loam; a smaller response was obtained from phosphates. N increased the boll weight and upper half mean length of fibres, but decreased the lint percentage and X-ray angle. P merely increased the size of the boll. K increased the boll weight, mean weight, fibre weight per inch, percentage of mature fibres, and X-ray angle, but decreased lint percentage and Pressley index. Top bolls gave lower values for boll weight, upper half mean, and mean length and higher values for lint percentage, fineness, and Pressley index. Applications of K reduced scutcher and card waste, lowered the number of neps, and slightly improved the grade of the yarn, but decreased the yarn strength. N applications increased the N content and reduced the oil content of cotton seed, but K reduced the N content and increased the oil content. The seeds from the top bolls were consistently poorer in oil. C—**1C.**

Cotton Leaf Worm and Cut Worm: Sex and Food Odours. B. Flaschenträger and El Sayed Amin. *Nature*, 1950, **165**, 394. Two Egyptian cotton pests, the leaf worm (*Prodenia litura*, Fab.) and the cut worm (*Agrotis ypsilon*, Rott.), have been investigated with respect to the attraction of the male moth by the female moth by chemical substances. An apparatus (odour analyser) has been develop for the chemical and biological study of sex- and food-odours. Some information on the sex-odour of the cotton leaf worm has been collected, and the "odour" has been frozen out at −20° C. The odour of fermenting Egyptian wheat beer, which attracts the moths of cotton pests, has also been studied. C—**1C.**

Indian Cotton: Supply. ("Indian faces a Cotton Shortage.") H. W. Spielman. *Textile Weekly*, 1950, **45**, 788-790 (from "Foreign Crops and Markets",

U.S. Department of Agriculture). The serious decline in cotton production in India is emphasised. The crop harvested in 1948-49 was only 1,960,000 bales, the smallest since 1879, and the estimate for 1949-50 is only 2,325,000 bales. Consumption of cotton in India in 1948-49 was 3,750,000 bales. The prospects of importing sufficient cotton into India are doubtful. **C—1C.**

(D)—ARTIFICIAL

Alkali-cellulose: Degradation during Ripening. Trigvye Bergek. *Norsk Skogind*, 1948, **2**, 289-296 (in Swedish). (through *Chem. Abstr.*, 1950, **43**, 8674[e]). The rate of degradation during the ripening of alkali-cellulose decreases when a degree of polymerisation of about 150 has been reached. This may be due to the fact that the inner parts of the crystallites are not exposed to the degrading attack. In all cases a higher speed of reaction can be expected in the amorphous parts of the fibre wall, suggesting that xanthation is an intermicellar reaction. The chemistry of the xanthation process is discussed briefly. Variations in the viscosity from variations in the alkali concentration can be ascribed to both an agglomeration and a solvation effect. **C—1D.**

Alkali-cellulose and Viscose: Oxidative Reactions. S. N. Danilov, N. M. Grad and E. I. Gefne. *J. Gen. Chem. U.S.S.R.*, 1949, **19**, 826-842 (through *Chem. Abstr.*, 1950, **43**, 9430[a]). Oxidation of alkali-cellulose (measured by oxygen uptake) is sharply retarded by sodium sulphite or its mixture with sodium sulphide; the latter alone is less effective. The action of these salts is complex as they also remove sulphur from viscose mixtures. A large number of observations on oxygen consumption are reported. **C—1D.**

Cellulose: Xanthation by Emulsified Carbon Disulphide. Olof Samuelson. *Svensk. Kem. Tid.*, 1949, **61**, 79-89 (through *Chem. Abstr.*, 1950, **43**, 9436[e]). A method is described for comparing the reactivities of cellulose preparations towards carbon disulphide emulsion. It was applied to normal wood pulp, pulps purified in the cold and in the hot, and cotton linters. In general, mercerisation followed by dilution and washing augmented the reactivity, but impregnation with caustic soda solution without successive dilution had little effect. **C—1D.**

Viscose: Ripening: Oxidation-Reduction Addition of Sulphur. S. N. Danilov, N. M. Grad and A. F. Vorob'eva. *J. Gen. Chem. U.S.S.R.*, 1949, **19**, 1257-1289 (through *Chem. Abstr.*, 1950, **43**, 9439[i]). Reactions which occur during the ripening of viscose involving oxidation-reduction addition of sulphur are reviewed. The sequence of reactions of carbon disulphide appears to be as follows: the reaction proceeds *via* salts of dithiocarbonic acid which are cleaved by caustic soda into salts of monothiocarbonic acid, which in turn yield sodium sulphide and possibly carbonyl sulphide; the action of sodium sulphite on dithiocarbonates yields the trithiocarbonates which hydrolyse to sodium sulphide and sodium carbonate. Hydrolysis of cellulose xanthates proceeds with caustic soda through salts of dithiocarbonic acid, but hydrolysis by sodium sulphide or sodium hydrosulphide gives trithiocarbonate directly. There are 35 references to the literature. **C—1D.**

PATENTS

Alginate Threads: Continuous Extrusion. Courtaulds Ltd., E. E. Tallis and H. R. S. Clotworthy. B.P.624,987 of 22/6/1947: 20/6/1949. A continuous process for the production of alginate threads comprises extruding an aqueous alkali alginate solution, *pH* below 9·5, into a neutral bath containing an alkaline earth metal salt (*e.g.* the chloride) in demineralised water, washing the congealed thread on thread-advancing devices with demineralised water, treating the washed thread with a cation-active compound, *e.g.* by passing it over a wick wetted with cetylpyridinium bromide, and drying. C.

Organic Silicon Compounds: Application to Viscose Spinnerets. Algemeene Kunstzijde Unie N.V. B.P.625,748 of 3/12/1946: 4/7/1949 (Conv. 31/1/1946). To prevent clogging, viscose spinnerets are wiped with an organic silicon compound(*e.g.* a mixture of $MeSiCl_3$ and Me_2SiCl_2). C.

Sulphite Pulp: Purification. S. E. Seaman. B.P.625,961 of 28/3/1947: 6/7/1949 (Conv. 18/10/1944) and B.P.625,962 of 28/3/1947: 6/7/1949 (Conv. 1/4/1944). (1) Sulphite pulp in the form of a suspension or slurry is treated with caustic soda in a number of stages and the liquor, after various stages, is expressed and employed in previous stages for subsequent batches. The amount

of water in the pulp and in the caustic soda solution are adjusted so that the concentration of alkali in the first stage is about 9 per cent. (2) The pulp is treated on the counter-current principle and fresh caustic soda is used in the final stage. Suitable apparatus is shown in machine drawings attached to each specification. C.

Animal Fibres: Treatment. R. Handley and J. G. Mitchell. B.P.633,618 of 19/12/1949. The economic deposition of impregnating materials, including insecticides, on the fibres of living animals may be obtained by using emulsions of the oil-in-water type containing an anionic or cationic emulsifying agent. With an anionic emulsifying agent the deposition is increased or decreased according as the fibres are acid or alkaline, and *vice versa* for a cationic agent. Thus in the case of natural wool a cationic agent will give an increased deposit, and a local deposit may be obtained by swabbing or spraying the sheep with a cationic emulsion. Local variations in density of deposition on the animal may be obtained by treating parts of the body with a dilute acid solution and applying an anionic emulsion. The process is particularly suitable for the deposition of D.D.T. on the fleece of sheep. W.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A)—Preparatory Processes

American Fibre Blending Systems. ("Quelques techniques américaines de mélange.") R. Dicker. *Rayonne*, 1949, **5**, No. 11, 85-86; No. 12, 77, 79-80. Some important principles of fibre blending are reviewed, and brief, illustrated descriptions are given of four blending systems developed by Messrs. Proctor and Schwartz: (i) Simple system; (ii) System with two openers; (iii) Semi-automatic system; and (iv) Automatic system. C—2A.

"Celconus A" Cotton Spraying Oil: Application. ("Dust Suppression by Cotton Oiling.") Shell Chemicals Ltd. *Textile Weekly*, 1950, **45**, 680; *Textile Mercury & Argus*, 1950, **122**, 471-472. A brief announcement is made of an oil and machine for spraying raw cotton. A diagram of the unit is provided. The aim is to add not more than 0·2 per cent. of oil to the cotton and the cost per lb. of cotton is about 0·015 pence. C—2A.

Dutch Rayon Staple Spinning Mill. ("De A.K.U.-proefspinnerij in de Kleefse Waard te Arnhem.") J. A. Keverling Buisman. *Enka en Breda Rayon Revue*, 1949, **3**, 149-156. An illustrated account is given of the lay-out and equipment of a 10,000-spindle staple fibre spinning mill which started production in 1949, and is intended to be a pilot mill for the spinning of all types of artificial fibres. C—2A.

Rayon Staple Fibre: Processing on the Cotton System. ("La fibre de rayonne en filature à coton.") J. Deschacht. *Rayonne*, 1949, **5**, No. 6, 37-49; No. 7, 29-39; No. 9, 59-67; No. 11, 40-45; No. 12, 41-48. An illustrated account is given of the various steps involved in the processing of rayon staple fibre on the cotton system under the following main headings: treatment in the mixing and beater rooms, carding, drawing, processing on the fly frame, and spinning. C—2A.

Staple Fibre/Cotton Blends: Advantages. ("Fibre de rayonne et coton . . . un mariage heureux.") J. Deschacht. *Rayonne*, 1949, **5**, No. 11, 73-79. Advantages arising from blending cotton with staple fibre are discussed. Reference is made to the selection of rayon staple of suitable denier and staple length, choice of blending method, and choice of twist factor. The characteristics of mixture fabrics are considered. C—2A.

Electric Drive Control for Cotton Waste Breaking Machines. Messrs. George Clegg Ltd., Edenfield. *Textile Mercury & Argus*, 1950, **122**, 510-511. An illustrated account is given of a switch room control panel for the "devil hole" of a cotton waste spinning mill having five sets each of six waste breakers in tandem. Each set has its own control panel which secures that the six motors are started automatically in sequence at 15-seconds intervals, the delivery and cylinder first. Pneumatic timers provide that two starting-current peaks cannot overlap. C—2A.

Revolving Top Flat Card: Maintenance. William Langlois. *Whitin Review*, 1949, **16**, No. 6, 23-32. Information is provided, with illustrations, on the maintenance and setting of the Whitin Model "L" revolving top flat card. A lubrication scheme is outlined. C—2A.

Model P2E Drawing Frame. Whitin Machine Works. *Whitin Review*, 1949, **16**, No. 5, 10-11. Preliminary details are announced of the Whitin Model P2E drawframe. The machine produces Bi-Coil sliver in 14-in. diameter cans and is fitted with an electric stop motion. The spread between the rollers has been increased to deal with fibres up to 2 inches long. Spiral gearing is incorporated in the head and foot ends to produce a more even sliver. A photograph of the machine is shown. C—**2A.**

Whitin Model J Comber: Operation. Whitin Machine Works. *Whitin Review*, 1949, **16**, No. 5, 21-25. Some observations are made on the performance of the Whitin Model J high speed comber. Data and staple diagrams are presented for combings made on two commercial cottons of different staple lengths. C—**2A.**

Wool Fibre: The Importance of Humidity in Processing. J. Ingham. *J. Textile Institute*, 1950, **41**, P7-8. Suggestions are made for the optimum conditions of relative humidity, temperature and wool regain for woollen and worsted carding, spinning and weaving. Factors affecting these are discussed. W—**2A.**

Josephy Woollen Card: Gear Drives. C. Josephy. *Textile World*, 1950, **100**, 136. In the redesigned machinery, power is transmitted by gears to the various elements of the card from a long drive-shaft mounted alongside the card, and this arrangement is said to permit easy changes of speeds and to eliminate flat belts. The American style Josephy card is built with one-cylinder breaker card and two-cylinder finisher card, and the Continental-style card has three separate cylinders connected by two intermediate feeds. The condenser has several innovations, particularly in the tape condenser, and the drive for the eccentrics from a separate motor is new. W—**2A.**

Wool Carding. G. Marshall. *Text. Mercury and Argus*, 1950, **122**, 442. A report of a lecture contains references to the work carried out by Varga. After referring to the main functions of the card, namely, to open, mix and level the constituents of a blend, the lecturer considered the principal carding actions and the subject of speeds. W—**2A.**

Wool Carding. *Wool Record*, 1950, **77**, 423, 425, 427, 497, 498, 501. A general description of the rubbers and rubbing motions is given, and suggestions are made regarding the selection and use of different types of rubbers. Information relating to the adjustment of the condenser for crossbred and fine wools, cleaning of leathers, *etc.*, is included. W—**2A.**

(B)—Spinning and Doubling

Roving and Spinning Frame Ball Bearing Top Rollers: Maintenance. Whitin Machine Works. *Whitin Review*, 1949, **16**, No. 6, 33-35. Some illustrated notes are offered on the lubrication of ball-bearing top rollers for roving and spinning frames. C—**2B.**

Whitin Bobbin Clutch. Whitin Machine Works. *Whitin Review*, 1949, **16**, No. 5, 28-31. An illustrated description is given of a Whitin bobbin clutch that consists simply of a clutch spring held inside the clutch shell, the whole unit being mounted on the spindle. The bobbin is claimed to be held firmly and centrally. Bobbin specifications for use with this clutch are given. C—**2B.**

Novelty Yarns: Production on Whitin Twisters. Cyril Taylor. *Whitin Review*, 1949, **16**, No. 6, 15-22. The Whitin "C" and "C-1" novelty yarn attachments are briefly described and illustrated. General types of novelty yarns are described with coloured illustrations; they include spiral, ratine, nub, loop or bouclé, and flake yarns. A splash yarn attachment, which imparts different speeds to the same roller and thus produces "splashes" or bunches, is also mentioned and illustrated. C—**2B.**

Wool: Sequence of Processes in Washing and Combing Plant. Draft German Standard DIN 60415, *Text.-Praxis*, 1949, **4**, 9, 442. A description of the sequence of processes through which wool passes during washing and combing. W—**2B.**

Worsted Spinning: Sequence of Processes. Draft German Standard DIN 60416, *Text.-Praxis*, 1949, **4**, 442. A description of the sequence of processes through which wool passes during the spinning of worsted yarn, starting with the dyeing of the combed top. W—**2B.**

Nylon in the Wool Industries. *Hosiery Trade J.*, 1950, **57**, No. 674, 46. A report of a lecture to the Cumberland Textile Society by Mr. P. Thornton includes references to the use of continuous filament nylon yarn and mention

is also made of the use of 4 in. staple with an anti-static finish in the worsted system of spinning. W—**2B.**

Woollen Ring Spinning: Efficiency. ("Ring Type Frames Provide Efficiency in Wool Spinning.") *Textile Industries*, 1950, **114**, No. 2, 93-94. A saving in floor space, reduction in labour costs, and increased production resulted from the installation of eighteen Whitin Model E spinning frames (120 spindles) in place of thirteen mules which occupied the same space. W—**2B.**

Worsted Yarn Cheese and Cone Winding. R. S. Audley. *Fibres*, 1950, **11**, 93-96. The article reviews briefly the purposes of winding, and the evolution of winding machines up to the modern automatic winders, in particular the Abbott travelling spindle winder. Suggestions for maximum production include an adequate supply of bobbins for the winder and the use of automatic knotters. The importance of yarn clearing is stressed. W—**2B.**

Woollen Yarns: Spinning. *Fibres*, 1950, **11**, 55-56. Woollen spinning by means of the woollen frame is compared and contrasted with the mule. Several different wool spinning frames are described, and recent mechanical improvements mentioned. Some suggestions relating to the technique of woollen frame spinning are included. W—**2B.**

Five-stage Worsted Process. *Amer. Wool & Cotton Rep.*, 1949, **63**, No. 36, 16-17, 19, 51. A perfected worsted system based on the cotton method of fibre processing has been produced by Saco-Lowell Shops. A Warner and Swasey pin drafter is used, followed in some cases by a drawing process, generally one process of roving, and then completion of the yarn on a spinning frame. The pin drafter is equipped with a baller head which forms a package on to a fibre core, and the drawer has a similar baller motion; both the drawing frame and roving frame have creels designed for the use of balls. A new drafting system is used which is capable of handling a wide range of fibre staple lengths and fineness. W—**2B.**

Worsted Spinning Mill: Data and Conclusions from Work Studies undertaken on Ring and Mule spinning Machines. ("Erkenntnisse und Folgerungen aus vorgenommenen Arbeitsstudien an Ring- und Wagenspinnern in einer Kammgarnspinnerei.") W. Posselt. *Textil-Praxis*, 1950, **5**, 150-152. Work studies were made on ring and mule spinning machines in a worsted spinning mill using worsted yarns and a mixture of worsted yarn and staple fibre. It was found that the work load of the spinners could be increased by specialisation of the various tasks. Modifications introduced as a result of the work studies included improved cleaning methods and devices, and the provision of doffing, cleaning and bobbin-laying teams. W—**2B.**

PATENTS

Self-adjusting Roller Drafting Apparatus. British Thomson-Houston Co. Ltd. B.P.624,765 of 26/6/1944: 16/6/1949 (Conv. 26/6/1943). The claim is for a drafting apparatus that comprises two pairs of drafting rollers between which is located a flow tube for the sliver, sub-divided into a series of chambers (three are shown in the drawings), a supply of a fluid (*e.g.* air) under controlled pressure in the tube, and regulating means responsive to variations in pressure in the tube due to fluctuations in the density of the sliver, for adjusting the speed relation and therefore the drafting action of the rollers. The rollers are driven by a pair of shunt-field motors the field-windings of which are respectively in series and in parallel with a variable resistance comprising a stack of discs responsive to the pressure. C.

Running Yarn Foam Conditioning Apparatus. Reymes-Cole's Patents Ltd., Chamberlain & Co. (Burbage) Ltd., I. H. Reynolds and A. W. Peet. B.P. 625,032 of 21/5/1946: 21/6/1949. Apparatus for conditioning a running thread (*e.g.* nylon at a knitting frame) comprises a container in which a foam is created by admitting air under controlled pressure into soap solution, and means for guiding the yarn through the foam. Various types are shown in the drawings. C.

Drafting Roller Saddle Weighting System. Dobson & Barlow Ltd. and Fred Walsh. B.P.625,868 of 23/1/1947: 5/7/1949. In a saddle weighting system for drafting mechanism there is interposed between the bottom end of the weight hook hanging from the roller saddle and a continuation of the hook through which the weight is applied, a lever pivoted at different points to both parts of the hook whereby, as the lever is lifted at one end, the two points are relatively

moved in opposite directions until they are in the same vertical line, and the pull of the weight is applied directly to the saddle, the weight being removed from the saddle by the opposite movement of the lever and being transferred to a fixed part of the machine from above which the ends of the two parts of the weight hook and lever are disposed. C.

3—CONVERSION OF YARNS INTO FABRICS

(A)—Preparatory Processes

Automatic Bobbin Loader for Whitin-Schweiter Weft Winder. Whitin Machine Works. *Whitin Review*, 1949, **16**, No. 6, 1-6. An illustrated description is given of an automatic bobbin loader and delivery unit for use with the Whitin-Schweiter weft winder. The new attachment comprises a large-capacity hopper, an automatic delivery and supply mechanism to deliver empty bobbins to the winder units and an automatic return for surplus bobbins. Some performance figures show large increases in spindle assignments when the loader is used. C—**3A.**

Knitting Yarns: Warping. ("Het scheren van kettingen in de tricotage-industrie.") J. C. Meijberg. *Enka en Breda Rayon Revue*, 1949, **3**, 165-170. Some modern warping equipment for the knitting industry is discussed and illustrated, including Reiner, F.N.F., and "Helix" (Belgium) warping machines. The present tendency is to warp a greater number of threads at the same time. C—**3A.**

Nylon Hosiery Yarn: Processing. H. Marsden. *Textile Mercury & Argus*, 1950, **122**, 345-352, 385-390; *Textile Weekly*, 1950, **45**, 540-544, 596-602, 668-672. Current American practice in the processing of nylon hosiery yarn is described under (1) types of yarn on the market and their prices, (2) air conditioning and process control, (3) up-twisting, (4) twist setting, (5) sizing—the operation, size circulation system and viscosity control. C—**3A.**

Yarn Winding Machines: Improvements in Precision. E. Brierley. *Textile Weekly*, 1950, **45**, 736-744. A report of a lecture on more precise machines for yarn preparation, with special reference to the automatic winders, warping creels and high-speed warpers made by Messrs. Thomas Holt Ltd., Rochdale. C—**3A.**

(B)—Sizing

Carboxymethyl Celluloses: Application in Sizing. ("Essais d'applications des carboxy-méthyl-celluloses à l'encollage des textiles.") G. Ulrici. *Teintex*, 1949, **14**, 463-477. An account is given of the first results obtained in a study of sizing and finishing agents based on carboxymethyl celluloses (CMC) under the headings: (i) Description of carboxymethyl celluloses; (ii) Sizing experiments with CMC; and (iii) Other applications. The sizing tests have been carried out on woollen and cotton yarns, with three carboxymethyl celluloses of different viscosities and degrees of substitution. The results are tabulated and show an improvement in the mechanical properties of the yarns. The superiority of CMC over other sizing agents seems to be in its film-forming property, and the CMC employed in sizing should have a high degree of substitution and good viscosity. Some special effects and improvements obtained in finishing treatments by the use of CMC are mentioned, with particular reference to its application in printing. C—**3B.**

(C)—Weaving

Saurer 100 W Automatic Two-shuttle Silk and Rayon Loom. ("The Loom Becomes a Weaving Machine.") A. Saurer, A.-G. *Silk & Rayon*, 1950, **24**, 170, 172. An illustrated description is given of the Saurer 100 W silk and rayon loom. This two-shuttle loom has a double magazine, shuttle change being effected by means of an electrical feeler device. Features include reversing mechanism, continuously variable pick-changing mechanism and a positive automatic let-off motion. C—**3C.**

Stationary Reed and Sley Loom. ("Loom Development: A New Principle of Design.") A. S. C. Hart. *Textile Manufacturer*, 1950, **76**, 61-62. A new principle of loom design is outlined. The reed remains fixed, enabling the depth of shed to be reduced. The sley is also stationary, and the fell of the warp is brought up to the reed. The reduced movement and reduced weight which are attained by these arrangements enable picking speed to be increased by approxi-

mately 30 per cent. The principle has operated effectively as a prototype on a narrow fabric. C—**3C.**

(D)—KNITTING

Full-fashioned Stockings: Manufacture. H. Wignall. *Textile Manufacturer*, 1950, **76**, 58-60. The article outlines briefly the developments which ultimately led to the invention of the straight-bar, vertical needle, power operated frame. Diagrams illustrate the knitting action of the bearded needle, the action of the sinker, the formation of loops and the yarn feeding motion of the modern machine. C—**3D.**

Milanese Warp-knitting Machine. ("Le métier chaine, type milanais.") P. Delangre. *Rayonne*, 1949, **5**, No. 11, 87-89; No. 12, 65, 67. The Milanese-type warp knitting machine still holds its own, because it permits the production of characteristic fabrics, particularly continuous diagonals. An illustrated description is given of the loop formation and of the production of tartan effects ("Ecossais"). C—**3D.**

(G)—FABRICS

Colour and Weave Effect Fabrics: Design. ("Uncommon Effects in Common Weaves.") D. C. Snowden. *Textile Recorder*, 1949, **67**, September, 139-141. Some unusual colour-and-weave effects obtained with common weaves are described and illustrated with weaving diagrams. C—**3G.**

Crêpe Weaves: Design. ("Wilde bindingen.") Tine Raspe. *Enka en Breda Rayon Revue*, 1949, **3**, 171-184. Various methods of designing crêpe weaves are described and illustrated, particularly the application of 6-, 10-, and 12-shaft crêpe weaves. C—**3G.**

Ladder-resistant Knitted Fabrics: Construction. ("Nogmaals: ladderbestendig tricot.") M. H. van der Noordaa. *Enka en Breda Rayon Revue*, 1949, **3**, 190-202. With this paper the author concludes his illustrated discussion of recent patents for the production of ladder-resistant knitwear. (See also *J. Textile Institute*, 1948, **39**, A337, and 1949, **40**, A447.) C—**3G.**

Nylon Yarns and Fabrics: Properties and Uses. G. Farrington. *Textile Weekly*, 1950, **45**, 730-734. A report of a lecture, giving a summary of the established characteristics of nylon yarns and fabrics and mentioning new uses. C—**3G.**

Rayon Crêpe Fabrics: Production. ("La pratique de l'achèvement des tissus crêpe rayonne.") P. Swillens. *Rayonne*, 1949, **5**, No. 6, 125-127; No. 7, 125-129; No. 10, 61-63; No. 11, 47-52; No. 12, 90-92. The effects of sizing and of twist of rayon crêpe yarns are discussed and the composition of a crêpe fabric is considered. Discontinuous crêpeing and desizing methods are reviewed, and the continuous method of preparation is discussed. Difficulties and precautions to be taken in these methods are pointed out. C—**3G.**

Rayon/Wool Mixture Cloths: Construction. Courtaulds Ltd. *Textile Weekly*, 1950, **45**, 714-718. Particulars are given, partly by tabulation, of dress fabrics and tropical suitings now being produced from mixtures of spun rayon and wool at the "Bull Royd" development mill, Bradford. C—**3G.**

PATENTS

Loom Picking Motion. Rudolf Hrdina. B.P.624,373 of 18/9/1946:7/6/1949 (Conv. 29/4/1946). An under-pick motion is claimed in which the drive to the picking stick is from a cam on a shaft on the axis of oscillation of the sley, the lower end of the stick having a co-operating bowl. The nose of the cam is adjustable and rests against an adjustable roller when the picking motion has been performed. The picking stick is guided by a double-joint suspension which is enclosed in a common casing with the cam. C.

Knitting Machine Clutch and Pattern Drums Operating Mechanism. Hemphill Co. B.P.624,864 of 11/6/1946:17/6/1949 (Conv. 23/6/1945). Mechanism for operating a clutch drum and a pattern drum of a knitting machine (*e.g.* of the Banner type) comprising means for mounting the pattern drum for step by step rotation independent from the step by step rotation of the clutch drum, means for rotating one of the drums through a given angle per step, means for rotating the other drum through a smaller angle per step, and common means for controlling both rotating means so that

either, neither or both of the drums may be rotated. Details are shown in five sheets of machine drawings. C.

Axminster Carpet Loom Tuft-cutting Mechanism. Brintons Ltd. and C. C. Brinton. B.P.624,882 of 22/10/1946: 17/6/1949. Tuft cutting mechanism for an Axminster carpet or other tufted-fabric loom comprises a spring-loaded knife comb fixed to a support in the loom and a movable cutter comb sandwiched between the knife comb and its support, each comb being built up from a set of toothed plates in end-to-end contact lengthwise of the support. C.

Axminster Carpet Loom Gripper Mechanism. Brintons Ltd. and C. C. Brinton. B.P.624,883 of 22/10/1946: 17/6/1949. Gripper mechanism of the intermittently rotatable type for Axminster carpet or other tufted-fabric looms comprises a number of rows of grippers mounted (at equal intervals) on the sides of a beam, each row being reciprocable upon the beam in a path at right angles to its axis. Details are shown in eleven sheets of machine drawings. C.

Automatic Weft-replenishing Loom Spent Bobbin Receptacle. Crompton & Knowles Loom Works. B.P.624,925 of 20/11/1946: 20/6/1949 (Conv. 26/3/1946). The support for a receptacle for spent bobbins (*e.g.* a bag) on a weft-replenishing loom is provided with slotted guideways so that the receiver can be removed easily for emptying, but is prevented from swinging during weaving. C.

Circular Rib Knitting Machine Dial Holding Mechanism. Scott & Williams Inc. (assignees of R. H. Lawson). B.P.625,301 of 31/1/1947: 24/6/1949 (Conv. 11/3/1946). A circular rib knitting machine having a pair of needle carriers, a pair of cam carriers, and means to cause relative rotation between the pairs of carriers, is fitted with means for holding the carriers of one pair (A) fixed relatively to each other. The mechanism comprises a block having an arcuate face, mounted in a fixed position relative to a carrier of pair (A), a slotted circular disc that can rotate in the curve of the arcuate face of the block on an axis fixed relatively to the other carrier of pair (A), and yarn guides fixed relatively to the other pair of carriers and mounted so that they can pass between the disc and the block. C.

Self-selecting Reed Hook. G. H. Fowell. B.P.625,472 of 1/3/1947: 28/6/1949. The claim is for a reed hook that comprises two block-like holders carried by a frame. One holder is for the reception of a hook-slotted blade (A) of hard wood or other material that will not damage the reeds, and the other holder has a handle and is for a pivoted rocker member that carries a pair of blades (B) and (C) that overlap the first blade. The tip of blade (B) is bent over so that it is held by an aperture in blade (A) and the tip of (A) is bent so that it is held by an aperture in the blade (C). The rocker member is spring-loaded and adjustable by a screw. C.

Automatic Loom Weft-replenishing Mechanism. Co-operative Wholesale Society Ltd., Thomas Southwell and Frederick Williamson. B.P.625,489 of 25/7/1946: 29/6/1949. The invention relates to the provision of a light spring-loaded feeler device on the "protector" mechanism that is used to put the cop-changing mechanism out of action if the shuttle does not go right home into the shuttle box. If the shuttle projects, the feeler device brings into action a trip member operated by the bunter on the advancing sley (or other moving part of the loom) so that the protector is operated by the loom part rather than by the shuttle directly, and in time to unlatch the cop-changing mechanism. C.

Net and Lace Spool Winding Machine. Douglas Porter. B.P.625,593 of 1/4/1947: 30/6/1949. The invention relates to means for automatically stopping a winding spindle on completion of a spool for use in the shuttles of net and lace machines. The spindles are driven by friction discs and means are provided to lift them vertically out of contact with the driving discs when the spools are full. C.

Knitting Machine Safety Cams. Hemphill Co. B.P.625,621 of 18/7/1947: 30/6/1949 (Conv. 13/5/1943). A knitting machine of the "Banner" type, having selecting butts and a fixed master cam engageable with a master butt, is fitted with a safety cam pivoted between the butt-selecting means and the master cam so that its downward-sloping cam surface can swing up towards the master cam in order that any master butt positioned so as to collide with the end of the master cam will engage the safety cam and, if necessary, swing

it until the butts are caused to move to a position where they can pass below the master cam. C.

Circular Hose-pipe Loom Warp Tensioning Device. Christian Christiansen and G. O. K. Rusch. B.P.625,702 of 16/12/1946: 1/7/1949 (Conv. 14/12/1945). A device for tensioning or checking the warp threads in circular looms for weaving hose-pipes (of hemp, *etc.*) without the use of heavy weights, comprises one or more (*e.g.* two) drums or rollers over which the threads are passed (*e.g.* in **S**-form) and which are held stationary when the threads are pulled forward, but rotate when they run backwards at the closing of the shed. C.

High-speed Warp Knitting Machine Warp Let-off Motion. F.N.F. Ltd., J. L. M. Morrison, R. T. C. Woodward, Robert Peel and Edwin Greaves. B.P. 625,894 of 12/2/1946: 6/7/1949. The invention relates to a sensitive device for controlling the feeding of yarn to or from a package that varies in diameter, and especially to a let-off motion for the warp in a warp knitting machine running, say, at 1,000 courses per minute. A moving member is driven by the running thread at a speed proportional to the linear speed of the thread, and a second, adjacent member is driven at a constant speed. Means responding to the difference between the speeds are arranged to vary the ratio of an infinitely-variable speed gearing through which the package is driven so as to keep the peripheral speed of the running thread constant. There are 18 claims and details are shown in 18 sheets of machine drawings. C.

Flat-bar Knitting Machine "Stop" and Re-starting Mechanism. Co-operative Society Ltd. and L. H. Michie. B.P.625,956 of 21/3/1947: 6/7/1949. The claim is for motor driving mechanism whereby on the approach of a knot in a yarn the machine to which the yarn is fed automatically slows down until the knot is worked in and then returns to normal speed. It is particularly designed for flat-bar knitting machines. A feeler mechanism, influenced by the knot, trips a lever that operates two switches, one to effect reduction of the speed of the variable-speed driving motor and the other to operate a re-setting motor. This in turn operates a delayed-action device that allows time for the knot to be knitted in before the re-set trip lever returns the driving motor to normal speed and stops the re-setting motor. C.

Straight-bar Warp Knitting Machine for Pile Fabrics. S. G. Dehn (for Vanity Fair Mills Inc.). B.P.625,969 of 15/1/1946: 7/7/1949. The invention relates to the construction, combination and arrangement of parts of a straight-bar warp knitting machine employing bearded needles, knock-over sinkers, sinker nibs and thread guides, and thread guide racking means whereby the machine can be used to produce tricot fabrics, any other kind of fabric usually knit on tricot machines, or pile fabrics without the use of looper hooks or movable loop pullers. There are 22 claims and details are shown in 20 sheets of drawings. C.

Knitting Machine Electrical Warning and Stopping Mechanism. Frank Bevins. B.P.625,979 of 29/7/1946: 7/7/1949. The invention relates to electrical means for giving signals of faulty operation of a knitting machine (*e.g.* loading-up of the needles of a flat frame) or for incorporation in a stop-motion. The device consists of a blade-like contact "feeler" that moves in a carrier in association with a fixed contact for the purpose of making or breaking an electrical circuit in accordance with the occurrence of an abnormality. C.

Circular Knitting Machine Wrap Mechanism. Hemphill Co. B.P.625,991 of 3/4/1947: 7/7/1949 (Conv. 9/4/1946). A circular, independent-needle knitting machine having a wrap spindle and wrap horn is fitted with a support for the spindle that can be swung between positions in which the spindle is respectively eccentric to and concentric with the needle circle so as to raise the wrap horn into an inoperative position or lower it into the operative position. C.

Shuttle Box Swell. J. R. Tattersall. B.P.626,083 of 31/10/1946: 8/7/1949. The claim is for a shuttle box swell (especially for a Northrop loom) that comprises a shoe capable of rocking about a fulcrum for self-alignment with the shuttle and of yielding bodily to permit entry of the shuttle into the box, one of such movements being controlled by separate springs at opposite sides of the fulcrum. The shoe may be disposed in an elongated opening in the back of the box and fulcrummed by a carrier pivoted externally of the box back, the springs being compressed between the carrier and the shoe, and the shoe being held transverse to the fulcrum by means of stems that engage holes in the carrier. C.

Vertical Spindle Bobbin Winding Machine Over-wind Prevention Device. Wolsey Ltd., Henry Burrows, Charles Everett and P. D. Smith. B.P.626,099 of 31/3/1947:8/7/1949. To prevent over-winding of bobbins (*e.g.* for knitting) on vertical spindles, a yarn trapping or scissors-like severing device is fitted that accepts the portion of yarn between the bobbin and a guide on the riser when the bobbin is full and severs or traps the yarn through the engagement of the riser with a catch that otherwise holds the cutting device open. C.

4—CHEMICAL AND FINISHING PROCESSES

(A)—Preparatory Processes

Warp-knit Cellulose Acetate Fabric Pre-setting Machine. Van Vlaanderen Machinery Company. *Textile Recorder*, 1949, **67**, September, 146. A machine for pre-setting rayon tricot fabrics is briefly described. The machine smooths the fabric and removes crease marks and is also claimed to control the stability of cellulose acetate tricot. Sprays of boiling water directed towards the edges of the fabric uncurl them and keep them uncurled until the goods move between two parallel steel plates for the setting process. The commercial machine is expected to work at the rate of 2,500 yards per hour. C—**4A.**

(D)—Milling

Milling: Choice of Media and Machine Adjustments. G. L. Atkinson. *Text. Manufacturer*, 1950, **76**, 89. Attention is drawn to several factors which should be observed in milling cloth, and mention is made of lightweight cloths which present special difficulties. The relative merits of hard and soft soap, stocks, and the newer type rotary machine for the milling operation are discussed. W—**4D.**

(E)—Drying and Conditioning

Drying Wool and Wool Goods. ("Ueber das Trocknen von Wolle und Wollwaren.") F. Franz. *Textil-Praxis*, 1950, **5**, 54-58. The theory and practice of the drying of wool are discussed; various methods of drying are described, *viz.* copper cylinder drying machines, hot air dryers, infra-red and high frequency drying, and the precautions to be taken with them to avoid damaging the wool. W—**4E.**

Wool: Action of Heat: ("Zur Einwirkung von Wärme auf Wolle.") H. Zahn. *Textil-Praxis*, 1950, **5**, 7-10. The action of heat on wool is discussed in respect of (*a*) air-dry wool, (*b*) wool in the presence of water, and (*c*) stretched wool in water. The results of research carried out by various workers show that dry wool is considerably more resistant to heat than damp wool or wool in the presence of water; dried wool may be heated for a short time to 140°-150° C. without decomposition occurring provided that no chemicals are present which are capable of attacking the wool protein. The theoretical and practical applications of the work are discussed. W—**4E.**

(F)—Carbonising

Wool Carbonising in the Piece. Spooner Dryer & Engineering Co., Ltd., Ilkley, Yorks. *Textile Weekly*, 1950, **45**, 436, 438; *The Dyer*, 1950, **103**, 210-2; *Textile Mercury & Argus*, 1950, **122**, 310, 312. A description is given of an impregnation unit, coupled with a standard Spooner dryer, designed to combine the two processes of acid impregnation and drying. A modification for wool material with cotton or silk selvedges is mentioned. W—**4F.**

Carbonised Wool: Modified Method for Neutralising with Soda Ash. J. A. Perry. *Text. J. Australia*, 1949, **24**, 782. It is stated that the accepted practice (in Australia) for neutralising wool containing sulphuric acid is to use an alkaline solution containing soap and soda ash. In so doing a high *pH* value must be maintained to keep the soap in solution and lathering freely. The modified method, subject to application for Australian Letters Patent No. 26,361/49, uses soda ash only, which results in a saving of soap and soda ash. W—**4F.**

(G)—Bleaching

Hypochlorite/Chlorite Bleach Liquor: Application. M. P. Kozlov. *Tekstil Prom.*, 1947, **7**, No. 8, 30-31; No. 12, 23 (through *Chem. Abstr.*, 1950, **43**, 8687^{e}). (1) Bleaching of cotton with a mixture of calcium hypochlorite and sodium chlorite "decreased the weakening of the fibre two-fold". A bright and stable colour resulted. (2) In bleaching with mixtures of chlorite and

hypochlorite the decrease in the latter is rapid, but in the former relatively slow. C—**4G.**

Sulphite Pulp: Bleachability. H. W. Giertz. *Svensk Papperstidn.*, 1947, **50**, No. 11B, 94-95 (through *Chem. Abstr.*, 1950, **43**, 8678^{g}). The ease with which various sulphite pulps can be bleached is related to the degree of condensation of the lignin in the pulps. A method is proposed for evaluating this property. The sample is chlorinated and then washed with caustic soda, after which the residual lignin value is determined. Such values, together with K permanganate number and Roe chlorine number, are given for several series of sulphite pulps. The data illustrate that the reaction between lignin and chlorine becomes more difficult the more the cooking conditions favour condensation of the lignin. They also indicate that during the lignin condensation, these groups are blocked which normally react with chlorine. C—**4G.**

(I)—Dyeing

Cotton and Rayon Fabrics: Jig Dyeing; Effects of Warp Tension. ("Thread Tension as it affects Scouring and Dyeing in Jiggers.") A. J. Hall. *Fibres*, 1950, **11**, 5-7. A brief discussion is given of the effects of warp tension on the scouring and dyeing of fabrics in the jigger. Tension produces a closing up of the fibres in the yarns, which restricts liquor penetration. Topics mentioned include influence of temperature conditions, period of immersion in the liquor, fabric expanding devices, the dyeing of cellulose acetate fabrics, and the dyeing of cotton/viscose fabrics. C—**4I.**

Dyeing, Printing and Finishing in Australia. *Indian Textile J.*, 1949, **60**, 206-210. Extracts are given from a review of the dyeing, printing, and finishing industry in Australia, published by the Division of Industrial Development, Commonwealth of Australia. Demand and supply in the industry, equipment and methods used, output, and the labour situation are discussed. Although the demand for woven cotton textiles is large, most are imported in the finished condition. About one-sixth of the woven rayon piece goods consumed in Australia are woven and dyed locally. C—**4I.**

Naphthol Dyes: Application. Bert Celentano. *Amer. Dyes. Rept.*, 1950, **39**, 117-118. Various aspects of naphthol dyeing are briefly discussed. The procedure for package dyeing is described, and methods for beam and jig dyeing and for padding are outlined. The importance of pure water is stressed, and the naphthol dyeing of nylon and cellulose acetate is mentioned. C—**4I.**

Natural Indian Dyes: Sources and Methods of Application. A. N. Gulati. *Indian Textile J.*, 1949, **60**, 223-229. A list of natural Indian dyes and their sources is presented. Historical notes are given on some of these dyes. The following ancient methods of application of dyes are discussed: tattooing, tie-dyeing, multi-coloured dyeing, hair dyeing, gold and silver printing, painting, food colouring, ivory dyeing, and calico printing. C—**4I.**

Dyes: Reversible Polymerisation and Molecular Aggregation. L. Michaelis. *J. Phys. & Colloid Chem.*, 1950, **54**, 1-17. A review of reversible polymerisations in the field of "molecular compounds" is presented, in the following sections: (I) The reversible molecular aggregation of dyes; changes which occur in the spectra of some dyes with change of solvent (*e.g.* from aqueous to alcoholic media) are described and discussed. (II) Quinhydrone-like molecular compounds; quinhydrones formed from a hydroquinone and a quinone and the analogous compounds formed from an aromatic *p*-diamine and a corresponding diimine are considered. (III) Molecular compounds composed of two different molecular species; *e.g.* the compound of phenol and quinone or chloranil and hexamethylbenzene. C—**4I.**

Logwood Colouring Matters: Constitution. D. J. Duff. *Dyer*, 1950, **103**, 271-273. Some notes are offered on the chemical constitution of hæmatoxylin and brazilin, and structural evidence is outlined. C—**4I.**

Dyeing: Short Process for Indigosols. *The Dyer*, 1950, **103**, 209. A new dyeing process which can be applied to the wool fibre in all stages of manufacture and on all types of dyeing machine has been introduced by Durand and Huguenin. Details of the process are given, and its advantages are (1) the time required for dyeing and oxidation is reduced to 35 to 45 minutes, (2) dyeing is carried out at about 85° C., and (3) the Indigosols (with a few exceptions) are dyed in a neutral bath. W—**4I.**

Dress Goods: Dyeing. *Wool Record*, 1950, **77**, 813, 815, 817. In a general review of the preparatory processes (crabbing, steaming and scouring), several suggestions relating to the attainment of satisfactory results in the dyeing process are made. W—**4I.**

(J)—PRINTING

Copper Printing Rollers: Prevention of Damage and Repair. *Textile Recorder*, 1950, **67**, February, 80-83. Methods of preventing and repairing damage to copper printing rollers are reviewed. Types and angle of engraving are first described and sources of damage are then discussed. These include foreign matter in the print paste, corrosion of the doctor edge by acidic pastes, frothy pastes, and grit in the fabric. Methods of protection from these sources of trouble are indicated and a general account of the care and repair of rollers is given. C—**4J.**

Vat Colours: Printing. *Textile Manufacturer*, 1950, **76**, 86-88. Some aspects of vat colour printing are considered under the headings: vat pastes and powders; alkalis—potash and soda ash; reducing agents—formosul, sodium hydrosulphite, glucose and zinc hydrosulphites and sulphoxylates; hygroscopic agents—glycerin and urea; solvents, *etc.*; print colour notes; and pre-ageing conditions. C—**4J.**

(K)—FINISHING

Textiles: Chemical Modification. ("Textile Industry Changes Pace.") R. E. Wright and Milton Harris. *Chem. Engng. News*, 1950, **28**, 38-39. Recent advances in textile technology are briefly surveyed. New methods of producing cross-linkages, the introduction of amino and carboxymethyl groups into cellulose and the partial acetylation of cellulose are mentioned. Some of the latest work on wool is outlined and new fibres (Vicara, Orlon, Dynel and Celcos) are dealt with. Under dyeing, high-temperature dyeing processes (*e.g.* the Thermosol process) are briefly discussed. The final section covers the blending of fibres for comfort. C—**4K.**

Textile Fabrics: Anti-shrink Finishing. ("The New Finishes; Dimensional Stability in Fabrics and Garments.") *Textile Mercury & Argus*, 1949, **121**, 498-505, 537-540, 881-884, 1005-1006, 1045-1048, 1081-1084, 1164-1169, 1205-1207; 1950, **122**, 184-189, 231-235, 275-280, 437-440. A popular account is given of the causes of the shrinkage of cotton and rayon fabrics in washing (fibre swelling, yarn stretch, *etc.*) and of mechanical and chemical anti-shrink finishes. Early and modern methods for rendering wool unshrinkable and treatments of cellulosic materials with formaldehyde and glyoxal are reviewed. C—**4K.**

Crêpe Fabrics: Latent Energy in Fibres and Yarns. A. J. Hall. *Fibres*, 1950, **11**, 41-43. An illustrated account is given of the production of crêpe fabrics. The formation of the crêpe by the untwisting of the highly twisted yarn is described and the way in which this is carried out in practice is indicated. Fabric shrinkage during crêpeing, irregularities in crêpeing, the control of crêpeing and the use of the pre-embossing calender as an aid to controlled crêpeing are also dealt with. C—**4K.**

Cloth Shrinkage in Garment Production. *Wool Science Review*, 1949, No. 4, 25-34; 1950, No. 5, 3-11. The factors contributing to cloth shrinkage and ways in which the cloth manufacturer, the maker-up, and the textile scientist can work together in overcoming the shrinkage problem are discussed. W—**4K.**

Textile Fibres and Fabrics: Softness and Handle. F. Bryant. *Text. J. Australia*, 1949, **24**, 804. The effects on handle of bleaching, dyeing and finishing are discussed, and the importance of finishing processes in this respect is emphasised. Special mention is made of wetting and drying operations, and the detrimental effect of a high temperature and/or drying for long periods. Reference is made to the "Flexease" Tester for silk, nylon, and rayon knitting yarns. W—**4K.**

(L)—PROOFING

Coated Fabrics: History. ("Yesterday's Coated Fabrics.") F. J. Tuttle. *Interchem. Rev.*, 1949, **8**, No. 1, 15-17. The development of coated fabrics up to the beginning of this century is briefly reviewed. The writer deals with the manufacture of oil-silk, waterproof paulins, oilcloth, rubber-coated fabrics, pyroxylin-coated fabrics and artificial leather. C—**4L.**

Tetra-alkyl Orthotitanate Waterproofing Agents. ("Organic Compounds of Titanium.") R. J. Speer and D. R. Carmody. *Ind. Eng. Chem.*, 1950, **42**, 251-253. The tetra-alkyl orthotitanates, obtained by the action of titanium tetrachloride on alcohols, are very effective waterproofing agents. These compounds are capable of imparting a water-repellent finish to paper, cotton, wool, silk, artificial fibres, felt and wood. Experimental procedures which have been used for the treatment of materials by this agent are briefly described and one hypothesis for the mechanism of the waterproofing action is outlined. C—**4L.**

Wool: Insect Proofing. ("Mothproofing of Wool," Part 4.) *Wool Sci. Rev.*, 1949, No. 4, 3-15. Treatments to protect wool from attack by moth and beetle grubs are described. Physical protective measures are first dealt with—airtight containers, mechanical agitation, temperature control—then volatile protectants which include solid, liquid and gaseous fumigants. Chemical protectants, inorganic and organic, are dealt with in some detail, special attention being paid to a class of white products similar in other properties to dyes, *e.g.* the Eulans. The effect of staple fibre admixture on the susceptibility of wool fabric to larval attack is illustrated. Future possibilities are mentioned and a bibliography is given. C—**4L.**

Fishing Nets: Preservation. B. Farrer. *Brit. Columbia Research Council, Tech. Bull.*, 1949, No. 11, 72 pp. (through *Chem. Abstr.*, 1950, **43**, 8688[d]). Experiments showed that phenylmercury chloride and copper naphthenate were effective in reducing deterioration of fishing nets. Both required an abrasion-resistant after-coating. The deleterious effect of linseed oil as an after-coating was reduced by dissolving it in a volatile solvent. Cutch followed by copper sulphate in neutral or ammoniacal solution preserved linen and light cotton gear from weathering. Dichromates were useless for fixing cutch on nets. Heavy cotton web was protected against bacterial action, abrasion, and weathering by treatment with cutch-copper sulphate-coal tar. Lacing twines were preserved effectively with a cold dip of coal tar, a volatile solvent, and copper naphthenate. When treated in this way, they were more easily handled than when hot-tarred. C—**4L.**

Phenylmercuric Ions: Sorption on Fibres. ("Control of Micro-organisms in Pulp and Paper Mills." II.) S. O. Pehrson and N. J. Lindberg. *Svenska Träforskningsinst., Middel.* 40. (Reprint from: *Svensk Papperstidn.*, 1948, **51**, 439-446.) The results are reported of preliminary experiments dealing with the sorption of phenylmercuric acetate on fibres, as determined by means of a biological method which is described in detail. Mechanical and chemical pulp fibres retain a great part of the disinfectant added. The greatest retention takes place on groundwood pulp fibres. Smaller amounts are sorbed on sulphate and sulphite pulp. The sorption is greatly influenced by the amount of fibre. The influence of different concentrations of aluminium sulphate on the reaction of phenylmercuric acetate has also been studied. A considerable reduction of the inhibiting effect of the mercurial compound (on the growth of micro-organisms) is found in the presence of fibres, but by the addition of aluminium sulphate this effect is reduced. C—**4L.**

Wood Pulp: Bacterial Blueing and Rotting. ("A Bacterium Occurring in Wet Mechanical Pulp Producing a Heat-stable, Highly-fungicidal Substance.") Stig Pehrson. *Svenska Träforskningsinst., Middel.* 27. (Reprint from *Svensk Botanisk Tidsk.*, 1947, **41**, 354-364.) Preliminary observations on the blueing and rotting of wood pulp are reported. An antagonistic organism has been isolated from fresh pulp (and the white water and slime of the paper mills). The organism plays an important part in retarding the growth of blueing fungi. The fungistatic properties of the isolated bacterium have been studied, including the effect of temperature on its antibiotic activity. The substance does not lose its activity at 100° C. C—**4L.**

PATENTS

Continuous Loose Cotton Scouring Apparatus. Johnson & Johnson (Gt. Britain) Ltd. B.P.624,633 of 8/10/1946: 14/6/1949 (Conv. 19/10/1945). The claims are for a method and apparatus for continuously treating loose fibre with liquids, *e.g.* for scouring cotton. The apparatus consists of a somewhat L-shaped conduit, the lower part being almost horizontal and discharging the the fibre as a worm-like plug on to a roller conveyor. The loose fibre and liquid are fed to the top of the vertical limb. A V-shaped slot is cut in the upper part

of the horizontal limb and covered by a sheath that leaves space for liquid to escape (for re-circulation) as the plug is thrust forward. It is claimed that with a liquor to cotton ratio of 70 to 1 and a conduit of 18 inches diameter it is possible to scour cotton at the rate of 1,000 lb. per hour, or about 2½ times the rate possible with a kier of 5,000 lb. capacity. C.

Cockled Cellulose Acetate Fabric: Production. British Celanese Ltd. B.P. 624,720 of 31/10/1946: 15/6/1949 (Conv. 31/10/1945). Fabric made of or containing a substantial proportion of a thermoplastic yarn (*e.g.* cellulose acetate fabric) is fed from a roll by means of a driven friction roller on to a heated plate (*e.g.* at 250-280° C.) where it remains unconstrained long enough (1-5 seconds) for the thermoplastic yarn to soften and cause local buckling of the fabric so that it presents a cockled appearance, whereupon it is removed from the plate. To prevent sticking of the fabric to the plate the latter is lubricated with a silicone grease. C.

Glyoxal: Application in Crease- and Shrink-proofing. Cluett, Peabody & Co. Inc. B.P.624,733 of 24/12/1946: 15/6/1949 (Conv. 29/1/1946 and 27/9/1946; addition to B.P.585,679). Regenerated cellulose materials are rendered stable in dimensions and resistant to creasing without impairing their softness by impregnation with an aqueous solution at *pH* 1·0 to 2·5, containing glyoxal and an acidic catalyst (oxalic acid or ammonium chloride), and baking at about 212° F. The examples give results of tests of warp-way shrinkage. (See also *J. Textile Institute*, 1947, **38**, A505.) C.

Stocking Drying Machine. W. M. Cissell. B.P.624,853 of 10/7/1947: 16/6/1949 (Conv. 14/11/1938). The claim is for a machine for drying socks and stockings on hollow forms, in which the series of forms are arranged around a rotatable hollow support through which hot air reaches the forms *via* appropriate openings. Any one form may be moved out of the drying position without interrupting the stream of hot air to the other forms. C.

Screen Printing Apparatus. Dan Walker and David Evans & Co. Ltd. B.P. 625,108 of 29/4/1946 and 16/4/1947: 22/6/1949. The invention relates to mechanism for applying the squeegee in screen printing so that the process is not so dependent on the skill of the operators. There are 30 claims and details are shown in 8 sheets of machine drawings. C.

Lignocellulosic Material: Single-step Pressure Cooking. L. R. Gans. B.P. 625,130 of 11/9/1946: 22/6/1949. In single-step alkaline pressure cooking for producing bleachable pulp from lignocellulosic material the mass is quickly brought to the temperature at which the incrustants react with the caustic liquor "with the utmost reaction velocity" and the cooking time at full pressure is restricted to 20 minutes or less. "Critical temperatures of maximum reaction velocity" are tabulated for various common materials; they range from 200° C. for pine wood to 170° C. for bamboo. Thus, wood chips are cooked at 195-205° C., straw at 175-186° C. and reeds at 165-175° C. C.

Block Printing Machine. H. K. Colah. B.P.625,170 of 9/1/1947: 23/6/1949 (Conv. 16/1/1946). A block-printing machine for textiles comprises an endless-belt conveyor for the fabric and a block holder mounted for pivotal movement in a vertical plane towards or away from the fabric and in a horizontal plane towards or away from the "inking" means. Details are shown in six sheets of machine drawings. C.

Naphthenic and other Cyclo-alkanecarboxylic Acid Salts: Application in Strengthening Cotton Yarn. United States Rubber Co. B.P.625,184 of 26/2/1947: 23/6/1949 (Conv. 27/4/1946). The strength of cotton yarns (and other natural cellulosic yarns) is increased (by 60 per cent. or more) by impregnation with a solution of a sodium naphthenate or other cyclo-alkanecarboxylic acid, $C_nH_{2n}{}_{-x}O_2$, where n is 5 or more and x ranges from 2 to 8, followed by stretching nearly to rupture and drying under tension. Typical naphthenic acids are (1) the Everett acids, acid number 162, (2) the "rectified" acids, 224, (3) "bottoms", 183, and (4) the Aruba dark acids, 221, derived from Columbian gas oil. Typical strength tests are recorded for a Sakel × Pima cotton yarn before and after treatment. The yarns may be rubberised for tyres. C.

Chlorine/Chlorine Dioxide Bleaching Liquor: Production. Mathieson Alkali Works (assignees of H. N. Tatomer). B.P.625,201 of 17/4/1947: 23/6/1949

(Conv. 25/5/1946). The claim is for a system for making a solution of chlorine and chlorine dioxide ranging in ratio from 1:1 to 1:4, using it for bleaching paper, pulp, linters, regenerated cellulose, *etc.*, and recovering non-absorbed gases. The mixture of gases is formed, *e.g.* by the action of 50 per cent. sulphuric acid on a mixture of sodium chlorate and chloride. A substantial part of the chlorine and nearly all the chlorine dioxide are absorbed by water in a scrubber (and the liquor is used in a late stage of the bleaching process), and unabsorbed chlorine is scrubbed by make-up liquor from an earlier bleaching stage. C.

Pigment-coloured Yarns and Fabrics: Production; Use of Polyvinyl Resins. Courtaulds Ltd., John Boulton, Hermann Gorge and Charles Ford. B.P. 625,215 of 3/6/1947: 23/6/1949. Yarn and fabrics (of any known natural or artificial fibre) are treated with an aqueous dispersion containing a finely-divided pigment, a major proportion of polyvinyl chloride or polyvinyl butyral, and a minor proportion (about one-third as much) of a pre-condensed, fusible melamine-formaldehyde or urea-formaldehyde resin, and baking to render the resin infusible. A plasticiser for the polyvinyl compound may also be added. Just prior to use, diammonium hydrogen phosphate is added to the dispersion. The products are fast to washing and rubbing. C.

Hosiery Pre-boarding Machine. Proctor & Schwartz, Inc. (assignees of A. O. Hurxthal). B.P.625,480 of 3/4/1947: 28/6/1949 (Conv. 6/5/1946). The invention relates to a pre-boarding machine for hosiery (*e.g.* nylon stockings) in which the set of forms is pivotally arranged around a base connected with the steam supply and a vacuum line. The forms can be drawn together so that they may be covered by a dome for steaming or swung radially outward, after raising the dome, for the removal and replacement of the stockings. C.

Pigment-coloured Yarns and Fabrics: Production; Use of Alginate Resins. Courtaulds Ltd., John Boulton, C. C. Wilcock, Herman Gorge and H. W. Best-Gordon. B.P.625,609 of 3/6/1947: 30/6/1949. The pigment is dispersed in a solution of alginic acid or a metallic alginate, and the coloured material is dried and treated with an agent (*e.g.* formaldehyde) that reacts to form a resin with the alginate. Such an agent may be added to the dispersion (e.g. hexamethylenetetramine or paraformaldehyde) and the reaction effected by drying and baking. In a further stage, the material may be treated with a solution of a Cr, Pb or Al salt to render the alginate insoluble in soap solutions. C.

Modified Starch: Production. Corn Products Refining Co. B.P.625,688 of 15/8/1946: 1/7/1949 (Conv. 13/12/1945). Starch containing 1-30 per cent. of moisture is treated with aluminium chloride (0·05-0·5 per cent. of $AlCl_3.6H_2O$ on the weight of starch) at 20-105° C. and *pH* 2·8-3·4. Tables show the effects of time (to 1440 minutes) and moisture content of the starch (5, 10, 15 and 20 per cent.) on the specific viscosity and content of soluble matter when corn starch is treated with 0·1 per cent. of aluminium chloride at 100° C. and *pH* 3·2. Other tables show the effects on viscosity of varying the reaction temperature (100, 75 and 50° C.) and the amount of aluminium chloride (0·1 and 0·2 per cent.). Another table shows the effects of changing the method by which the aluminium chloride is blended with the starch (as a slurry, in the dry and in alcoholic solution). Particulars are given of the preparation of (1) thin-boiling starches, (2) dextrins, and (3) rolled soluble starch from corn starch and a final table compares the products of the modification of potato, rice, corn and tapioca starches. C.

Resin-bonded Cotton Cord: Preparation for Rubbering. Wingfoot Corporation. B.P.625,937 of 23/1/1947: 6/7/1949 (Conv. 31/7/1946). In a method of treating cellulose fibre, in particular cotton cord for rubber tyres, the fibres are bonded together by means of a mixture of a phenol-formaldehyde resol (100 parts) and an alkali rosinate (25-400 parts). The adhesive is set by a heat treatment at 300-600° F., which may occur during the vulcanisation process. Tests on 168/4/3 cotton cord before and after such a treatment are recorded: they include tensile strength at 70° F. and 55 per cent. R.H. and also at 250° F., fatigue tests (tyre inflation tests) and tyre puncture tests. C.

Continuous Roll Winding Machine. J. B. Kohler. B.P.626,039 of 27/11/1945: 8/7/1949 (Conv. 26/2/1944). A machine for continuously winding materials (paper, fabric, metal foil, wire, yarn, *etc.*) into rolls, comprises a primary drive for rotating successive supports, mechanism for severing the material when a

roll is complete and guiding the next portion on to the next support, and an auxiliary drive that operates to bring the new roll to the full surface speed in time to receive the material. There are 18 claims and 7 sheets of machine drawings. C.

Hat Bodies: Apparatus for forming. Merrimac Hat Corporation. B.P.632,310 of 21/11/1949. The invention provides a web supporting and guiding mechanism which automatically directs the web and controls its tension as the web passes to the shaping form during the forming of hat bodies. Means are also provided for automatically smoothing the web, by means of directed air currents, as it passes on to the shaping form, and for automatically controlling the wrapping of the web upon the ends of the form. These operations can be performed on a delicate web, such as a thin felt of carded short wool fibres as it issues from the carding machine, without injuring the web. W.

5—ANALYSIS, TESTING, GRADING AND DEFECTS

(A)—Fibres

Cotton Seed Lint Testing Instruments. G. N. Stroman. *J. Amer. Soc. Agron.*, 1948, **40**, 1043-1044, 1044-1045 (through *Plant Breeding Abstr.*, 1949, **19**, 348). A description is given of (1) a mechanical comber in use at the New Mexico Agricultural Experiment Station for determining lint length and uniformity, and (2) a rolling table holder for determining lint percentage and lint index in cotton breeding work. C—**5A.**

Textile Physical Laboratory: Equipment. ("Que doit-on trouver dans un laboratoire physique textile?") M. Bovyn. *Rayonne*, 1949, **5**, No. 11, 101-107; No. 12, 105-112. An illustrated account is given of instruments with which a physical testing laboratory should be equipped for determining staple length, fineness, strength, elongation, regularity of rovings, slivers and yarns, and wear resistance of sized yarns. Furthermore, reference is made to methods and instruments for testing fabrics for nature of raw materials, tensile strength, slippage, crease resistance, shrinkage, water resistance, bursting strength, air permeability, water vapour permeability, wear resistance, heat retention, resilience, and fastness of dyeings. C—**5A.**

Cellulose Fibre Amorphous Material: Determination. [(1) "Investigations on Cellulose Reactions VIII." (2) Cellulose Reactions, X.] Tore Timell. (1) *Svensk Papperstidn.*, 1949, **52**, 165-167. (2) *Svensk Kem. Tid.*, 1949, **61**, 125-127 (through *Chem. Abstr.*, 1950, **43**, 8671[e]). (1) Allylcelluloses of high degree of substitution were prepared from cotton linters, sulphite wood pulp, and viscose rayon. Addition of iodine bromide showed that the ether formation takes place in an initial rapid step and a second, slow step. On the assumption that the former involves the easily accessible or amorphous material, the amount of this was calculated for the three parent materials. Cotton linters have the smallest portion of amorphous cellulose and viscose rayon has the largest. These findings agree with previous results from periodic acid oxidation and suggest that the ratio between the amorphous and crystalline portion remains unchanged during the formation of fibrous esters from alkali cellulose. (2) Reaction of cellulose with sodium in liquid ammonia involves an initial rapid change, followed by a slow one. By plotting reacted material against time and extrapolating the linear part of the curve to zero time, the amount of the accessible or amorphous material can be assessed. Results are given for cotton linters, sulphite pulp, and viscose rayon. C—**5A.**

Irradiated Artificial Fibres: Tensile Strength and Degree of Polymerisation. Arnulf Sippel. *Kolloid-Z.*, 1949, **112**, 80-84 (through *Chem. Abstr.*, 1950, **43**, 9456[d]). A mathematical expression is derived for the relation of tensile strength to degree of polymerisation for macromolecular structures. A constant in this formula is assumed to characterise that fraction of the primary valency forces between the fundamental molecules which is of significance to tensile strength as well as light sensitivity and to be inversely proportional to the percentage of individual molecular chains ("crystallite bridges") which tie two crystallites together. C—**5A.**

Nylon: Moisture Sorption. ("Interaction between Vapours and High Polymers.") Malcolm Dole. *Ann. N.Y. Acad. Sci.*, 1949, **51**, 705-718 (through *Chem. Abstr.*, 1950, **43**, 8236[i]). The author has previously derived the sorption isotherm

$N/N_s = ac'/\phi$ in which N is the number of moles of vapour sorbed and N_s is the number of moles of sorption sites, both per unit of adsorbent, a is the activity of the vapour being sorbed, and ϕ' is the first derivative of ϕ with respect to a; $\phi = 1 + c_1a + c_1c_2a2 + c_1c_2c_3a3$ - - - - - - - . The constants c_1, c_2, *etc.*, are the ratios of the internal partition functions of the sorbed molecules in the first, second, *etc.* layers to that in the pure liquid. Seven graphs in each of which a/N is plotted against a are now given. They represent experimental data on various systems, including: water/collagen, water/polyvinyl alcohol, water/nylon, and water/isobutylated polyamides. Comparisons are made with Langmuir's equation and with the Brunauer, Emmett and Teller equation. C—**5A.**

Silk Fibroin: Structure. B. Drucker and S. G. Smith. *Nature*, 1950, **165**, 196-197. By paper partition chromatography it is shown that the denatured and "renatured" forms of water-soluble fibroin obtained previously[1] are chemically identical with fibroin itself. The disposition within the molecule of the constituent amino-acids of the "renatured" form has been investigated by means of a brief tryptic hydrolysis. A reasonably complete picture of the folded molecule of "renatured" protein has been obtained. In the fibroin molecule of molecular weight 33,000, three straight-chain sections can be envisaged with a total residue weight of 7,000 each, and containing only glycine, alanine and serine, linked by two regions of total residue weight 5,000 each, and containing all the bulky amino acids of the molecule. ([1]*J. Textile Institute*, 1947, **38**, A423.) C—**5A.**

Wool and Silk: Colour Reaction with Aconitic Anhydride. M. Palumbo. *Ann. chim. applicata*, 1948, **38**, 519-524 (through *Chem. Abstr.*, 1949, **43**, 8685[h]). A 0·5 per cent. solution of *cis*-aconitic anhydride in acetic anhydride colours wool and Lanital a deep red and silk pink, but nylon is not affected. C—**5A.**

Wool: Moisture Determinations. *American Dyestuff Reporter*, 1950, **39**, 129. (Report of a forum and discussion at Lowell Textile Institute, U.S.A.) The drying oven is most generally used for moisture determinations but electronic moisture testers and the distillation method of determining moisture content have been applied in some cases. The distillation method actually measures the amount of water on the material, whereas the oven method measures the loss in weight of the sample, thus including all volatile substances, *e.g.* fibre lubricants of the ester type. The use of octane (B.P. 110° C.) is advocated for the distillation method. The relative merits of different types of ovens are discussed. Sources of error when using electronic instruments are mentioned. W—**5A.**

Quality Numbers: Meaning. E. A. Clarke and R. A. Webet. *Wool*, (Massey College Wool Association), 1949, **1**, No. 2, 11-13. The relationship between quality and spinning properties is discussed, and the many factors which must be taken into consideration when assessing the quality of wool are enumerated. Details are given of the requirements of the United States Government, which show the first attempt to standardise tops on the basis of fibre fineness, and this method of assessment is examined. Results of an investigation into the relationship between fineness, crimp and quality are included. W—**5A.**

(B)—YARNS

Instron Electronic Tensile Tester. Harold Hindman and G. S. Burr. *Trans. Amer. Soc. Mech. Engrs.*, 1949, **71**, 789-796 (through *Chem. Abstr.*, 1950, **43**, 8748[d]). A new type of tensile-testing instrument uses electronic principles for both measuring the forces on the sample and for controlling its extension. Results are given of tests on a paper, and on natural and artificial fibres, yarns and fabrics. C—**5B.**

Tyre Cord: Adhesion to Rubber; Dynamic Compression Test. G. A. Pittman and E. R. Thornley. *Trans. Inst. Rubber Ind.*, 1949, **25**, 116-131. An improved laboratory method (Henley test) has been developed for the purpose of evaluating rubber/cord adhesion. The test piece consists of a single cord surrounded by a thin cylindrical layer of casing compound, which in turn is enclosed and protected by a thicker layer of rubber of standard composition. Such test pieces are subjected to cyclic compression and bending, under controlled conditions of cord tension and ambient temperature, in a special machine, which is described and illustrated. The degree of bond deterioration is determined by comparing the load required to pull the cord axially through that part of the rubber which has been subjected to compression after a specific

number of cycles, with that required to do so in a similar untreated test piece. The data show the rate at which the rubber/cord bond deteriorates with various degrees of compression and temperature, and examples are given of the use of the method for evaluating bonding agents for cotton and rayon cords. A general comparison is made between this and other adhesion tests. A discussion of the paper is reported. C—**5B.**

Viscose Rayon Tyre Cord: Adhesion to Rubber. ("Rubber-Rayon Adhesion.") Ray Thoman and H. H. Gillman. *Trans. Inst. Rubber Ind.*, 1949, **25**, 105-115. A study is presented on the static adhesion, in rubber-rayon materials, of two types of adhesives—a reclaim dispersion-casein mixture and a resorcinol-formaldehyde-latex system. The adhesion of these dips at temperatures up to 250° F., and after periods of hot air ageing is described. Adhesion falls off with increased temperature and after ageing. Brief experimental details are given. C—**5B.**

Yarn and Fabric: Relations between Tensile Strengths. ("Les rapports des résistances dynamométriques de fil et de tissu.") A. Blacke. *Rayonne*, 1949, **5**, No. 11, 53-55; No. 12, 49-55. The relation between the tensile strength of a yarn and a fabric made therefrom is expressed by: $R_t = F \times N \times R_f$, where R_t and R_f are the dynamometric resistance of the fabric (5 cm. wide) and the yarn, respectively, N the number of threads in 5 cm., and F a variable. Fourteen factors affecting the value of F are discussed. Results of a study by Essam of the influence of weave, warp and weft density, and twist coefficient on the value of F are tabulated. As a result of a report on the variation of strength with the variation of warp tension, the value of F has been established for a number of listed cases. Another approach has been made by Kjellstrand (1935), based on the ratio between specific strength and fabric density; the practical applicability of his theory is discussed. C—**5B.**

(C)—Fabrics

Textile Fabrics: Informative Labelling. ("Verder op de weg naar 'informatieve labeling'".) L. Corbeau. *Enka en Breda Rayon Revue*, 1949, **3**, 157-164. Following up previous discussions[1,2,3] the author examines further different possibilities of informative labelling for textiles, including indications concerning raw material composition, processing treatment, and use properties. A brief survey of the results of an enquiry among textile retailers and a short review of the development of informative labelling in other countries are also included. ([1]*J. Textile Institute*, 1948, **39**, A498; [2]Sweers, *J. Textile Institute*, 1948, **39**, A429; [3]van Capelle; Sweers, *J. Textile Institute*, 1949, **40**, A201.) C—**5C.**

Wool: Note on Disintegration in Abrasion Tests. H. F. Schiefer and J. F. Krasny. *J. Res. National Bureau of Standards*, 1950, **44**, No. 1, 9-14. This article also appears in *Textile Research Journal*, 1949, **19** No. 12, 802-809. (These abstracts, 1950, A137.) W—**5C.**

(D)—Other Materials

Dyeings: Fastness; Standardisation of Systems of Classification. ("Sur la determination des soliditès des teintures.") Henrich Ris. *Teintex*, 1949, **14**, 459, 461, 463. A survey is presented of the development of systems for the determination and classification of the fastness of dyes. The first attempt to standardise methods was made in Germany in 1911 when the D.E.K. "fastness commission" was founded. The D.E.K. system and its later modifications are briefly described. The work of the Society of Dyers and Colourists in England in this field is traced, and mention is also made of the I.C.I. system and the A.A.T.C.C. system in the United States for fixing standards of fastness. In Switzerland, as in most of Europe the D.E.K. system has been used, but different organisations have their modifications which make it difficult to achieve a European standard system of fastness specification. Some proposals which have been suggested are outlined. In 1947 a Swiss "Fastness Commission" was set up to consider the various existing systems and to attempt to derive a standard system from them. In 1949 an agreement was made between this commission and the French Textile Institute and unification between France and Switzerland has been achieved with regard to fastness to light, washing, alkaline milling, water, sea water, rubbing, ironing and carbonisation. C—**5D.**

Inter-Society Colour Council: Current Activities. E. I. Stearns. *Amer. Dyes. Rept.*, 1950, **39**, 109-112, 120. The work of the Inter-Society Colour Council is

discussed. Topics dealt with include organisation and membership, meetings and publications, and the work of various committees on problems connected with colour. The problem of standardising colour names is dealt with at some length and several colour charts are presented. C—5D.

PATENT

Electrical Resistance Type Moisture Content Meter. Marconi Instruments Ltd., C. F. Brockelsby and W. A. H. Todd. B.P.625,024 of 15/4/1946: 21/6/1949. The claim is for an instrument for indicating the moisture content of wool, cloth, tobacco, *etc.* from the electrical resistance of the material, which can be adjusted to allow for fluctuations in the temperature and the conductance of the material. That is, the instrument gives a reading proportional to $(\log R)-A$, to $\{\log(G-G_0)\}-A'$, to T/B and to T/B', where R is the resistance, A and A' and B and B' are constants depending on the material and the electrode structure, T is the absolute temperature, G is the total conductance and G_0 is the conductance due to the material. Circuit diagrams are shown. C.

7—LAUNDERING AND DRY-CLEANING

Enzymic Laundry Soaking Agents. O. Hromatka. *Mitt. chem. Forsch.-Inst. Ind. Österr.*, 1946, **1**, 36-37 (through *Chem. Abstr.*, 1950, **43**, 8711[a]). The use of pancreatic enzymes as laundry soaking agents is discussed. Albuminous dirt is disintegrated by the proteolytic enzymes into water-soluble products. Fatty soiling with dirt particles of soot, iron oxide, clay, *etc.*, is saponified by the lipases. The enzymes are applied most effectively at 37° C. The action of the enzymes is selective for albumin, fat, starch, mineral oils, and ink spots. German patents for such soaking agents are mentioned and manufacturing methods are described briefly. C—7.

8—BUILDING AND ENGINEERING

(A)—CONSTRUCTION AND MAINTENANCE OF BUILDINGS AND PLANT

Ebonite: Application in Rayon Machinery. United Ebonite and Lorival Co. *Textile Weekly*, 1950, **45**, 720. An illustrated note is given on the fabrication of "Lorival" ebonite rollers for the "Nelson" continuous rayon spinning machine. C—8A.

Water Pipes: Aerobic Microbiological Corrosion. Erik Olsen and W. Szybalski. *Acta Chem. Scand.*, 1949, **3**, 1094-1105, 1106-1116. (I) A description is given of a type of corrosion in water pipes, accompanied by the formation of "tubercles" consisting mainly of hydrated iron oxides and iron bacteria felt which lie over the pittings. The electrochemical nature of this corrosion is discussed and a theory is advanced according to which micro-organisms, especially iron bacteria, accelerate these processes. (II) An attempt was made to prove experimentally the hypothesis regarding the activity of iron bacteria during corrosion of water pipes. It could be shown that the iron bacteria play a decisive part in the formation of the "differential aeration cell" and in the mechanical reinforcement of the "tubercle", but that corrosion proceeds practically independent of the metabolic activity of iron bacteria. An attempt has been made to inhibit further corrosion by changing the equilibrium of the water in such a way that a compact protective layer of "chalky rust" is formed on the surface of the tubercle. C—8A.

(C)—STEAM RAISING AND POWER SUPPLY

British Cotton Mills: Electrification. ("Electricity in the Cotton Industry.") A. Ormerod. *Textile Weekly*, 1950, **45**, 676-678. Detailed criticisms are offered on several of the arguments advanced by Cox and Swale[1] in favour of more extended electrification in cotton mills. They relate to (1) the basis of calculation for weaving output, (2) steam consumption in sizing, (3) energy expended in weaving, (4) shuttle acceleration, and (5) the influence of lighting on output. ([1] *J. Textile Institute*, 1950, **41**, A38 and A142.) C—8C.

(D)—POWER TRANSMISSION

Chain Drives: Selection and Care. ("Efficient Power Transmission Calls for Careful Selection of Chains.") *Textile Recorder*, 1949, **69**, September, 150, 152, 154. Various types of transmission chains are described and their suitability for particular industrial purposes is indicated. Chain wear, chain wheels and chain loadings and the care and lubrication of chain drives are some of the topics dealt with. C—8D.

(F)—Lighting

Textile Mills: Lighting. ("L'éclairage dans l'industrie textile.") Edouard Clausset. *Rayonne*, 1949, **5**, No. 11, 108-113. Standards of lighting in the textile industry are briefly discussed and a table is given showing the minimum lighting required for certain jobs in various branches of the industry. C—**8F.**

(H)—Water Purification

Modified Sodium Silicate: Application in Industrial Water Softening. R. R. McDowell. *Industrial Chemist*, 1950, **26**, 51-54. "Modified" sodium silicate, formed by the interaction of sodium silicate and sodium bicarbonate is recommended for water softening. Industrial applications of the process, filtration problems and the economic considerations involved are discussed. C—**8H.**

Water: Industrial Applications. A. K. Beenie. *Text. J. Australia*, 1949, **24**, 659-666. The impurities present in water and their effects in the various processes for which water is used, including textile processing, are discussed, together with methods of removing the impurities. Methods of water softening are also described. W—**8H.**

(I)—Waste Disposal

Wool Scouring Wastes: Comparison of Methods for Treatment. S. E. Coburn. *Sewage Works J.*, 1949, **21**, 84-90. Physical and chemical analyses are given of waste liquor from detergent-scoured wool, the liquor having been treated by 3 methods (acid-cracking, coagulation with calcium hypochlorite and coagulation with calcium chloride). Sludge data are also given. The merits of the processes are discussed, and estimated chemical costs compared. Light detergent scouring of solvent-scoured wool produces wastes which are amenable to biological treatment. W—**8I.**

Wool Scouring Wastes: Treatment. J. A. McCarthy. *Sewage Works J.*, 1949, **21**, 75-83. American tests are described on the efficacy of various calcium salts for coagulating wool scouring waste water. The combined use of carbon dioxide and calcium chloride is a relatively simple, rapid and inexpensive method of treatment; it can be used with either flotation or sedimentation, and workable sludge of any desired moisture content can be obtained. Grease can be recovered from the sludge by acid-cracking and pressing. Details are given of the mechanics of the process, and of its cost and limitations. In collateral investigations, coagulation was not produced with sodium hypochlorite, barium hydroxide or barium chloride; satisfactory coagulation was however obtained by using carbon dioxide and very finely divided calcium carbonate. W—**8I.**

Sheep: By Products. ("Les Sous-produits du Mouton.") C. Jourdain. *Le Mouton*, 1949, **4**, 113-4. The various uses of the by-products obtained from sheep are described. W—**8I.**

Patents

Electrical Resistance Hygrometer. Eric Jones (Royal Aircraft Establishment). B.P.625,189 of 7/3/1947: 23/6/1949. The claim is for a device for indicating humidity which depends on the change in electrical resistance when a resistance wire is strained by reason of a volume change in a material that is sensitive to the humidity of the atmosphere. For example, a sheet of cellulose acetate is wrapped with four equal lengths of the same thin resistance wire, in zig-zag fashion, or a thin-walled cylinder of cellulose acetate is wrapped with four equal coils of wire, and one half is coated with a waterproofing agent so that it is indifferent to atmospheric humidity. The wires are connected, with a battery and galvanometer, to form a Wheatstone's bridge. Wiring diagrams are shown. C.

Air Conditioning Apparatus. R. A. Prasad Misra and Wild-Barfield Electric Furnaces Ltd. B.P.625,786 of 29/4/1947: 4/7/1949. An air conditioning apparatus (for hot, dry climates) comprises a casing, the bottom of which is supplied with water and which has at one side an air inlet grille, and on the opposite side a louvre-operated air outlet, behind which is a box-like screen packed with charcoal, coke, crushed brick, felt, loose cotton or glass fibre to offer a large surface to the air passing through it. Inside the casing is a motor that drives a fan adjacent to the inlet and also a slinger disc that picks up water from the reservoir and sprinkles it against the exit screen. For cold climates an electric or other heater could be fitted. C.

Wool Scouring Water: Treatment. Fields Point Manufacturing Corp. B.P. 627,873 of 17/8/1949. Wool scouring water direct from the scouring bowls is treated with calcium hypochlorite, in the ratio of 35 parts of scouring water to 1 part of bleaching powder solution, mixing being assisted by bubbling air through the liquid. The foreign matter forms 2 curds. The lighter curd is skimmed off and centrifuged, giving a high quality grease. The heavier curd is left to separate, treated with mineral acid, allowed to settle, and then passed through a filter press with steam, a low quality grease being obtained. The water is sufficiently clear and odour-free to be discharged into open streams or sewers. W.

9—SCIENCE

Asiatic Cottons: Anthocyanin Pigmentation. S. G. Stephens. *Genetics*, 1948, **33**, 191-214, 630-631 (through *Plant Breeding Abstr.*, 1949, **19**, 345, 346). The pseudoallelic series for the anthocyanin pigmentation in Asiatic cottons depends upon the interaction of at least three neighbouring loci. One, "*G*", determines the presence or absence of a spot at the base of the petal, and another locus, "*S*", determines the pigmentation of the spot when developed. When *G* and *S* are both present there is a red spot; *G* alone leads to a white spot. There is chemical evidence that the precursor of the pigment is a leuco compound and it appears that the two genes condition reduction processes and act on very similar though not identical substances, anthozanthin and the leuco-substance. **C—9.**

Kapok Tree: Genetics. H. J. Toxopeus. *Meded. Alg. Proefstat. Landb., Buitenzorg*, 1948, No. 56, pp. 19 (through *Plant Breeding Abstr.*, 1949, **19**, 348). The variability of the kapok tree (*Ceiba pentandra*) in Central and S. America, W. Africa, and S.E. Asia is described. The species shows considerable variation in America and Africa, but little in Asia, where the tree is highly self-pollinating. Genetics and origins are discussed. The species is probably endemic to both Africa and America and was introduced by man into Asia at an early time. **C—9.**

β-Amylase: Action on Amylopectin and Glycogen. T. G. Halsall, E. L. Hirst, L. Hough and J. K. N. Jones. *J. Chem. Soc.*, 1949, December, 3200-3207. The action on waxy maize starch, waxy sorghum starch, and rabbit-liver glycogen of crude β-amylase prepared from wheat flour has been compared with that of crystalline β-amylase, and the limit-dextrins so obtained have been examined. The starch limit-dextrins produced by the crystalline enzyme have much higher molecular weights than those given by the crude enzyme, but the ratio of terminal to non-terminal glucose residues present in the dextrins is the same (approximately 1 : 10). About 50 per cent. of the glucose residues of the original polysaccharide are eliminated by the action of the enzyme, leaving, both for starches and for glycogen, a limit dextrin containing twice the proportion of end-groups originally present. **C—9.**

Amylopectin and Glycogen: Enzymic Synthesis and Hydrolysis. ("On the Equilibrium State of Branched Molecules.") Karl Myrbäck and L. G. Sillen. *Acta Chem. Scand.*, 1949, **3**, 190-200. The paper deals with the pattern assumed by a branched macromolecule such as amylopectin or glycogen in equilibrium with a solution containing glucose-1-phosphate and the two phosphorylases causing the formation and breaking of α-glucosidic 1 : 4- and 1 : 6-linkages. Formulæ are derived for the partition of the glucose residues over different types of inner chains and end chains. Equations are also derived for the cases of reversible and completely irreversible synthesis giving ζ (the fraction of the glucose residues split off by the action of β-amylase) as a function of β (the degree of ramification). When these equations are tested with experimental values of β and ζ it seems that amylopectin is not in an equilibrium state, but rather approaches the case of irreversible synthesis. The values for glycogen appear to agree rather well with the formula for equilibrium. **C—9.**

Bacillus Macerans Amylase: Activity. K. Myrbäck and Ebba Willstaedt. *Acta Chem. Scand.*, 1949, **3**, 91-92. *Bacillus macerans* contains an amylolytic enzyme which converts starch, glycogen, *etc.*, into the non-reducing Schardinger dextrins (cyclo-amyloses). The action of the enzyme on starch is accompanied by an extremely rapid decrease in viscosity, indicating rupture of linkages in interior chains between branching points. In addition to this hydrolysis by

macerans amylase a formation of new 1:4-α-glucosidic bonds occurs (described as "transglucosidation"). Experiments confirm the view that the decrease in viscosity should be accompanied by increase in reducing groups. It has been verified that an increase in optical rotation occurs in solutions of the *macerans* enzyme, cyclo-amyloses and maltose (or certain other sugars). This is explained as due to the formation of higher open-chain saccharides through a reversion of the recognised action of the enzyme. An investigation of the "hydrolysis of Schardinger dextrins" is briefly mentioned. Results indicate that it is due to a joint action of *macerans* amylase and β-amylase, and can be explained on the basis of the reversibility of the *macerans* amylase action. C—**9.**

Cellulose-splitting Fungi of Palestine. Miriam Goldzweig. *Palestine J. Botany, Jerusalem Ser.* 4, 1947, 107-108 (through *Chem. Abstr.*, 1949, **43**, 8444e). A number of species of fungi isolated from soil, air, filter-paper, and old decaying books in Palestine were tested for their ability to split the cellulose of jelly-like membranes produced by *Acetobacter xylinum*. All decomposed some cellulose within 2-6 days. Pigmentation was observed. C—**9.**

Cellulose: Thermophilic Fermentation; Formation of Reducing Sugars. Lennart Enebo. *Acta Chem. Scand.*, 1949, **3**, 975-981. The paper deals with the formation of lower sugars in thermophilic fermentation of cellulose by a pure culture of a cellulose-decomposing bacterium, and with fermentation of sugars, especially glucose and cellobiose, by the same organism. By repeated addition of alcohol to the medium from cellulose fermentation and evaporation *in vacuo* to a minute volume, cellobiose and glucose fractions were obtained. The formation of small amounts of higher saccharides than cellobiose was also shown. Experiments with fermentations of different sugars with the cellulose bacterium showed that the rate of fermentation was highest for cellobiose followed by arabinose and xylose (equal), glucose and fructose. Cellobiose was fermented at a rate several times as high as that for glucose. During cellobiose fermentation a certain cellobiose activity was observed. C—**9.**

Potato P- and Q-Enzymes. ("The Enzymic Synthesis and Degradation of Starch," VI and VII.) S. A. Barker, E. J. Bourne, I. A. Wilkinson and S. Peat. *J. Chem. Soc.*, 1950; VI, 84-92; VII, 93-99. (VI) Directions are given for the preparation of the phosphorylase (P-enzyme) and the cross-linking enzyme (Q-enzyme) of potato, as stable, freeze-dried powders. The properties of purified P- and Q-enzymes are described. (VII) The results reported in the earlier communications in this series[1] are reviewed and correlated with the observations recorded in this paper. Evidence is given that, beyond reasonable doubt, Q-enzyme functions by a non-phosphorolytic mechanism. In this and other properties it appears to be distinct from the isophosphorylase also extracted from potatoes. The conclusion is reached that Q-enzyme is a transglucosidase, but not of the phosphorylase type, and that two amylopectin-synthesising systems represented by Q-enzyme and isophosphorylase may exist together in the potato. ([1] *J. Textile Institute*, 1949, **40**, A530.) C—**9.**

Starch: Viscosity-Molecular Weight Constants; Enzymic Determination. ("Investigations of Malt Amylase," Part IV.) Eskil Hultin. *Acta Chem. Scand.*, 1949, **3**, 895-897. The breakdown of starch by malt α-amylase is considered. If the number of linkages broken per unit time in enzymic depolymerisation processes, where all linkages are broken with equal ease, can be calculated from end group determinations, and if the modified Arrhenius-Staudinger formula is valid for the substrate, the viscosity molecular weight constant K_m of the substrate can be calculated from a conversion factor for the enzymatic activity. The constant for starch is $K_m = 0{\cdot}7 \times 10^{-4}$. C—**9.**

Analytical Weights: Corrosion Resistance. P. H. Bigg and F. H. Burch. *Nature*, 1950, **165**, 201. A selection of 100 gm. weights was exposed for two three-month periods over the working bench in each of five chemical laboratories. The most resistant weights were of highly polished stainless steel, 25 per cent. Cr, 20 per cent. Ni. C—**9.**

Chromatography: Precision Measurements of Adsorption and Exchange Isotherms from Column-elution Data. E. Glueckauf. *J. Chem. Soc.*, 1949, 3280-3285. The extent to which it is permissible to use elution data from chromatographic columns for the calculation of adsorption isotherms has been investigated. The conclusion is drawn that diffusion and non-equilibrium

phenomena do not greatly affect the form of the rear boundary of a chromatogram, if sufficient precautions are taken. An equation is deduced which permits the determination of accurate adsorption equilibria from chromatographic elution data, under conditions of moderate boundary disturbance. C—**9.**

Circular Paper Chromatograms: Applications. L. Rutter. *Analyst*, 1950, **75**, 37-42. An illustrated description is given of a modified technique in paper chromatography whereby components of mixtures are separated into circular zones, instead of the usual spots or bands. The advantages of the method are discussed. Some new means for detecting colourless adsorbates are outlined, and examples are given of the application of the technique in the analysis of biological materials, dyes, and inorganic substances. The possible importance of solubility considerations in the choice of developers is discussed. C—**9.**

Paper Chromatograms: Continuous Development. Jorma K. Miettinen and A. I. Virtanen. *Acta Chem. Scand.*, 1949, **3**, 459-464. Continuous development in descending paper chromatography is achieved by fastening a thick pad of cellulose at the foot of the filter paper and allowing solvent to be absorbed until the fastest moving component reaches the pad. Tertiary amyl alcohol shows the best resolving power; this and other alcohols are preferred, and cause less decomposition than collidine, *iso*butyric acid, and pyridine. C—**9.**

Refractive Index Chromatography. Nils Hellström and Henryk Borgiel. *Acta Chem. Scand.*, 1949, **3**, 401-407. The scope of chromatography has been enlarged by the introduction of refined methods for the measurement of changes in refractive power. An apparatus has been designed and marketed, in which changes in refractive power of a solution leaving the filter are recorded as a curve on photographic paper against the amount of solution. Some experiences from work with such a self-recording apparatus are given. Difficulties in the proper understanding of adsorption curves have arisen, but ways to eliminate them are shown. The rate at which the solution passes through the filter in certain circumstances has a great influence upon the shape of the adsorption curve for frontal analysis so far investigated. C—**9.**

Indicators: Developments. I. M. Kolthoff. *Anal. Chem.*, 1950, **22**, 65-69. Recent developments in the field of indicators are reviewed. The properties of some new substituted azo dyes and a few other indicators are tabulated. C—**9.**

Gases: Analysis. L. K. Nash. *Anal. Chem.*, 1950, **22**, 108-121. Recent developments in gas analysis are reviewed, including general methods and equipment and special methods for specific materials. There are 358 references to the literature. C—**9.**

Pulp: Moisture Content Titrimetric Determination. ("Determination of Water by Titration.") Axel Johanssen. *Svenska Träforskningsinst., Meddel.* 19. (Reprint from: *Svensk Papperstidn.*, 1947, **50**, No. 11B, 124-126.) In a titrimetric determination of water by a modified Karl Fischer method,[3] the sample is dissolved in or mixed with a solution of sulphur dioxide and pyridine in methanol and to this mixture is added from a burette a methanol solution of iodine. The preparation and standardisation of solutions is described and three examples of the use of the method are given, including moisture tests on pulp and rayon. In cases when the solution is dark coloured (evaporated pulp "black liquor") and the iodine colour change cannot be observed an electrometric titration method is used. Results obtained by this method are compared with those from oven drying for pulps and rayon. (*J. Textile Institute*, 1935, **26**, A648.) C—**9.**

Water: Micro-determination. Axel Johansson. *Acta Chem. Scand.*, 1949, **3**, 1058-1066. A modified Karl Fischer method for the micro-determination of water is adapted from the macro-method described by the writer (above). The hydrogen iodide formed in this reaction is oxidised by bromine to iodic acid, which is titrated in the usual way. An automatic titration apparatus is described. C—**9.**

Biochemical Products: Analysis. P. L. Kirk and E. L. Duggan. *Anal. Chem.*, 1950, **22**, 126-136. Recent developments in biochemical fractionation and determinative procedures are reviewed. The most important fractionation methods at the simple molecule level are chromatography and extraction, paper chromatographic methods having found wide application. The separation of proteins by alcohol fractionation systems and by electrophoresis and the isola-

tion of cellular structures by differential centrifugation are considered. Determinative methods are reviewed under the headings absorptiometry, isotope tracer techniques, and respirometry. There are 325 references to the literature.
C—9.

Cotton Seed and Peanut Meals and Proteins: Electrophoretic Analysis. M. L. Karon, Mabelle E. Adams and A. M. Altschul. *J. Phys. & Colloid Chem.*, 1950, **54**, 56-66. Cottonseed and peanut meals have been analysed electrophoretically. The factors investigated were (i) the effect of the kind of buffer used in the electrophoretic analysis, (ii) the *pH* of the buffer, and (iii) the effect of the solvent used to extract the protein from the meal. Peanut protein consists of two major and several minor components. The major components migrate as a single entity under most conditions. Cottonseed meal protein has two major and two minor components. By fractional precipitation involving a change of ionic strength of the sodium chloride solution which was used as the solvent, purified fractions of the major components could be obtained. C—9.

Fatty Acids: Analysis by Partition Chromatography. J. Boldingh. *Rec. Trav. Chim.*, 1950, **69**, 247-261. By applying the principle of partition chromatography for the quantitative determination of fatty acids, a technique has been developed in which new carriers for the immobile solvent phase have been introduced. The carriers are of a very low polar character and include synthetic and natural elastomers, the latter being the most extensively studied. With systems containing benzene absorbed in *e.g.* vulcanised natural Hevea rubber, as the immobile solvent, and with a strong polar solvent as the mobile phase, a straight quantitative micro-determination of the saturated *n*-fatty acids from C_6 to C_{18} has been made possible. Hydroxy fatty acids are also readily separated from their mixtures with normal fatty acids. Experimental procedures are fully described. C—9.

Glycols and Glycerol: Water Content Determination. C. B. Jordan and V. O. Hatch. *Anal. Chem.*, 1950, **22**, 177-179. A trustworthy method is described for determining the percentage of water, by volume, in solutions of glycol or glycerol, by a reflux distillation and salting-out process with 1-butanol as the refluxing medium. Forty samples of known composition, varying in water content from 1 to 95 per cent. were analysed. C—9.

Polyhydric Alcohols: Separation by Paper Partition Chromatography. Leslie Hough. *Nature*, 1950, **165**, 400. Reduction occurs when filter paper chromatograms of polyhydric alcohols are sprayed with an ammoniacal solution of silver nitrate and heated. This suggests a means of separating polyhydric alcohols, and the R_f values of a number of these alcohols on filter paper have been determined in various solvents, by the normal procedure for sugar analysis. Some R_f values for polyhydric alcohols and sugar glycosides are presented. The sugar glycosides and sucrose also reduce ammoniacal silver nitrate under the conditions used. Intimate mixtures of polyhydric alcohols may be separated by paper chromatography in the manner indicated and determined by periodate oxidation. C—9.

Proteins: Colour Reaction with Diphenylamine. Masaru Funatsu. *J. Faculty Agr. Kyusha Univ.*, 1948, **9**, 93-97 (through *Chem. Abstr.*, 1950, **43**, 9138[e]). Protein, 2-3 mg. is heated with 0·5-1·0 ml. of syrupy phosphoric acid containing a small amount of diphenylamine and stannous chloride until a red colour appears. On addition of a few drops of alcohol a blue or bluish green colour develops if the protein contains cystine (as little as 0·1 μg), cysteine or serine.
C—9.

Simple Sugars: Paper Partition Chromatography. L. E. Wise, J. W. Green and Ruth C. Rittenhouse. *TAPPI*, 1949, **32**, 335-336 (through *Chem. Abstr.*, 1950, **43**, 9433[f]). Paper partition chromatography was applied to the separation of the simple sugars obtained by partial hydrolysis of aspen and sprucewood, of holocellulose, spruce α-cellulose and various pulps. Limitations of the chromatographic method are discussed. C—9.

Sodium Hypochlorite Solutions: Oxidation Potentials. ("Accelerated Oxidation of Cotton Cellulose in Presence of Reducing Substances.") G. D Joshi, S. H. Mhatre and G. M. Nabar. *Proc. Indian Acad. Sci.*, 1949, **29A**, 277-287 (through *Chem. Abstr.*, 1949, **43**, 8671[g]). The oxidation potentials of sodium hypochlorite solutions at 30° C. are given for the range *pH* 9·13 to

9·95. They are higher at 30° C. than at 20° C. and this difference due to temperature becomes more marked with reduction in *pH*. C—**9.**

Cellulose: Rate of Depolymerisation by Sulphuric Acid. ("A Simple Equation for the Viscosity and the Rate Constant of High-polymer Substances Under Depolymerization.") Eskil Hultin. *Acta Chem. Scand.*, 1949, **3**, 465-473. A differential equation for the rate constant is derived for depolymerisation, namely, $k = 2K_m c_{gm} M_0 . (d1/\eta_{sp})/dt$, where K_m is the viscosity/molecular weight constant, c_{gm} is the concentration of basic moles per litre, and M_0 is the basic molecular weight. The theory is exemplified by some experiments on the depolymerisation of cellulose in sulphuric acid. When the cellulose concentration and its degree of polymerisation are high, the experimental values differ somewhat from those calculated from the formula. C—**9.**

Cellulose: Structure and Polymolecularity. The Svedberg. *Svensk Papperstidn.*, 1949, **52**, 157-164 (through *Chem. Abstr.*, 1949, **43**, 8670[i]). The frequency curves of cellulose were investigated by studies on the fractional precipitation of the nitrates, ultracentrifugal sedimentation, and osmotic pressure. A new osmotic balance is described and illustrated in the original. The curves are complicated functions, generally containing several maxima, but native and depolymerised celluloses all have a common maximum for degree of polymerisation of 70-100. Celluloses degraded by acid hydrolysis and ultrasonic waves were studied with the electron microscope, and by means of electron and X-ray diffraction. C—**9.**

Cotton Cellulose: Chain-length Distribution. H. A. Wannow and Fr. Thormann. *Kolloid-Z.*, 1949, **112**, 94-110 (through *Chem. Abstr.*, 1950, **43**, 9435[g]). American Upland cotton was purified, bleached, degraded with alkaline hydrogen peroxide, and nitrated. The degraded nitrocellulose was dissolved in acetone and fractionally precipitated with water. Viscometric and osmometric measurements were made on the various fractions and the chain-length distribution was calculated. The chain lengths of the fractions were not distributed symmetrically with respect to the measured degree of polymerisation of the sample, *i.e.* the main portion was homogeneous with longer chain length and the remainder was heterogeneous with shorter chain lengths. C—**9.**

Cotton and Wood Pulp Fibres: Hydrolysis and Fine Structure. L. Jörgensen. *Acta Chem. Scand.*, 1949, **3**, 780-782. Comparative hydrolysis experiments on cotton and wood pulp fibres are reported. The bleached fibres were swollen for 2 hours at 5° C. in caustic soda solutions of various concentrations. The moisture regains were determined as well as the average viscosity degree of polymerisation (D.P.) of the hydrolysed samples. The limit D.P. of cotton fibres remains constant until the alkaline solution is concentrated enough to cause intramicellar swelling (10 per cent. solution), when a sudden drop in D.P. occurs. With pulp, the limit D.P. decreases as the concentration of the alkaline solution increases. The constant limit D.P. of cotton shows that the mesomorphous transition between crystalline and disordered region is negligible. In the pulp fibres this area is of considerable size. The moisture regain data for the cotton bear out the hydrolysis data, but those for the pulp are confusing and are not in accord with the hydrolysis data. These facts are briefly discussed. C—**9.**

Nitrocellulose: Manufacture from Wood Pulp. N. Picton and N. S. Kelland. *Industrial Chemist*, 1950, **26**, 79-80. An industrial process is described for the manufacture of nitrocelluloses by direct nitration of wood pulp. C—**9.**

Crystalline Polymers: Plasticizing. C. B. Havens. *Ind. Eng. Chem.*, 1950, **42**, 315-319. Methods used for the evaluation of plasticizers in vinylidene chloride copolymers are presented. Equations are derived that express plastic properties as a function of plasticizer concentration. For each plasticizer three constants are determined that express plasticizer effectiveness in reducing melt viscosity, modulus or stiffness, and flex temperature, respectively. The effect of copolymer composition on plasticizer compatibility and effectiveness is shown. Impact, tensile strength, and elongation data are presented. C—**9.**

Hydrophilic Phenol-Formaldehyde Resins: Water Content. R. W. Bentz and H. A. Neville. *J. Polymer Sci.*, 1949, **4**, 673-688. The significance of the water content to the physical properties of phenol-formaldehyde resins at various stages of preparation is briefly discussed. A simple, rapid, relative method for

the continuous measurement of water content has been developed for following the process of dehydration and detecting the end-point. This consists in recording vapour pressure/temperature data while the resol is dehydrated under reduced pressure. The composition of a homogeneous mixture of liquids is reflected by its vapour pressure/temperature relationships and in this case a very sharp increase in the shape of the vapour pressure curve occurs at approximately the proper degree of dehydration. In order to standardise or calibrate such a relative method an absolute method for the analysis of water in resol has been developed. Relationships of vapour pressure, total volatile matter, total water, "free" water, and "bound" water have been determined by several experimental methods, and it is shown that during vacuum dehydration of the resin, the "free" water decreases to approximately one-eighth of its original content, while the "bound" water remains substantially constant. The binding of water is attributed to the methylol groups of the resol molecules, and its release during the cure or hardening of the resin is considered to result from the conversion of these groups to methylene bonds. C—**9.**

Polymer Science and Rubber Technology. Geoffrey Gee. *Trans. Inst. Rubber Ind.*, 1949, **25**, 88-104. A report is given of a lecture on possible advances in the technological application of natural rubber. Topics dealt with include the molecular structure and physical properties of natural rubber, vulcanised rubber as an engineering material, raw materials, the oxidation of raw rubber, and vulcanisation. C—**9.**

Terephthalic Acid: Preparation from *p*-Cymene. J. N. Ospenson. *Acta Chem. Scand.*, 1949, **3**, 211. By using acetic acid as solvent the oxidation of *p*-cymene to terephthalic acid by chromic acid takes place in a one-phase system. This results in a much more efficient production with greater yield—decreases the time required by the older method by 95 per cent. and increases the yield of terephthalic acid by over 40 per cent. C—**9.**

Urea-Formaldehyde: Reaction Kinetics. G. A. Crowe and C. L. Lynch. *J. Amer. Chem. Soc.*, 1948, **70**, 3795-3797; 1949, **71**, 3731-3733. (1) Evidence is presented of an equilibrium between monomethylolurea, and urea and formaldehyde. (2) The effects of varying *pH* and temperature on the reversible reaction between formaldehyde and urea have been studied, the polarograph being used to measure formaldehyde concentration. Equations are presented to relate the urea-formaldehyde reaction rate to the polarographic current of formaldehyde for changes of *pH* or temperature. The action rate appears to depend both upon the rate of dehydration of formaldehyde and rate of anion formation of urea. A method is given for estimating the fraction of dehydrated formaldehyde at various temperatures and *pH* values, based on polarographic wave heights of formaldehyde. C—**9.**

Vinyl and Allyl Polymers: Prediction of Shrinkage during Polymerisation. F. S. Nichols and R. G. Flowers. *Ind. Eng. Chem.*, 1950, **42**, 292-295. A method is described for predicting from its structural formula, the per cent. shrinkage of a vinyl- or allyl-type of monomer during polymerisation. Percentage shrinkage values (calculated from the densities of the monomer and polymer) are presented for 26 polymers. By using molecular models and a shadow-casting method, volumes of revolution for these polymers have also been obtained. A percentage shrinkage/equivalent volume of revolution curve shows that low shrinkages are attainable if monomers having large volumes of revolution are selected. C—**9.**

Adsorbents: Surface Area Measurement by Adsorption and Heat of Wetting Methods. S. J. Gregg. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 40-46. The author discusses the determination of surface area by (*a*) adsorption of gases, (*b*) adsorption of solutes from solution, and (*c*) heat of wetting. The applicability of the various isotherms (for gaseous adsorption) to the calculation of the monolayer capacity is discussed; provided the isotherm is of the Langmuir type or of the Brunauer, Deming, Deming and Teller[1] Type II the monolayer capacity can be deduced with reasonable accuracy and the absolute specific area calculated. Experimental methods for the determination of the sorption of gases are described. Adsorption from solutions and heat of wetting are dealt with less extensively. Of the three methods, only the adsorption of gases is capable at present of yielding values of specific area which are more than relative. ([1]*J. Textile Institute*, 1940, **31**, A692.) C—**9.**

Amino Acids and Peptides: Adsorption Experiments. R. L. M. Synge and A. Tiselius. *Acta Chem. Scand.*, 1949, **3**, 231-246. Experiments are described which indicate that adsorption analysis on charcoal in aqueous solution can be used for the group separation of aliphatic from aromatic peptides, and for the further separation of the latter according to the number of aromatic amino-acid residues in the molecule. Effects of stearic acid, phenol, ethanol, cetylpyridinium bromide and hydrochloric acid on the adsorption phenomena have been studied and in some cases utilised for improving the separations. Some new data are presented on the relative roles of partition and adsorption phenomena in filter paper chromatography. C—**9.**

Surface-active Materials: Activity Coefficient in Aqueous Solutions. H. M. Scholberg. *J. Phys. & Colloid Chem.*, 1950, **54**, 107-114. A method is suggested for the determination of the activity coefficient of surface-active materials at low concentrations in aqueous solutions. The wetting agent is sealed up in a test tube and the "depth" of the meniscus is measured. From this and other relevant data the surface pressure of the material is calculated. The activity coefficient is obtained from surface pressure/log concentration curves. Data are presented to show that the method has wide applicability. The Gibbs adsorption equation is discussed with respect to the method, and the apparent lack of applicability of this equation to such systems is shown to be due to large variations in the activity coefficient of dissolved surface-active material. C—**9.**

Wetting Liquids: Contact-angle Hysteresis. S. Baxter. *Nature*, 1950, **165**, 198. The contact angle θ measured in a liquid is given by

$$\cos\theta = \frac{\gamma_{SA} - \gamma_{SL}}{\gamma_{LA}} \qquad \ldots\ldots(1)$$

where γ_{SA}, γ_{SL}, and γ_{LA} are the surface free energies per unit area of the solid-air, solid-liquid, and liquid-air interfaces, respectively. In general, equation (1) may be written:

$$\gamma_{SA} - \gamma_{SL} = k\gamma_{LA} \qquad \ldots\ldots(2)$$

A method for measuring k is based on an extension of the theory of the water repellency of porous surfaces.[1] Results obtained for various organic liquids and for water with a wetting agent added are discussed briefly. [1See *J. Textile Institute*, 1935, **36**, A351.] C—**9.**

Cellulose Micelle Aqueous Colloidal Solutions. B. G. Rånby. *Acta Chem. Scand.*, 1949, **3**, 649-650. Cellulose micelles from cell walls have been obtained in aqueous colloidal solution and observed as isolated morphological units by means of the electron microscope. After considerable degradation of the wood or cotton cellulose fibres, the sols are prepared by peptisation. The process is described. Brief mention is made of the some of the electron microscope, X-ray and electron diffraction observations. The electrophoretic mobility and intrinsic viscosity of the colloidal cellulose have also been measured. C—**9.**

Coiling Long Chain Molecules: Estimate of the Volume Effect. J. J. Hermans. *Rec. Trav. Chim.*, 1950, **69**, 220-224. An approximate treatment of the volume effect in coiling molecules is based upon the assumption that the probability of finding the end of a chain element at a given point at distance A from the preceding chain element is determined by the average density at this point. An estimate of the volume effect is derived from data on cellulose derivatives and paraffins. C—**9.**

Dissolved Chain Molecules: Stretching by the Introduction of Side Groups. H. Deuel and H. Neukom. *J. Polymer Sci.*, 1949, **4**, 759-761. The shape of chain molecules in solution is not fixed, because of the free rotation of single bonds. Factors which restrict this rotation usually cause a stretching of the molecule. Rotational restriction may result from side groups introduced into the molecule and the stretching of the chains can be detected by an increase in the viscosity and in birefringence of flow. This steric effect has been demonstrated with aqueous solutions of pectic and alginic acid esters containing easily removable side groups. Some results are presented to show the change in specific viscosities of aqueous solutions of glycol mono-esters of alginic acid with different degrees of esterification and at several temperatures. C—**9.**

Polydispersed Macromolecules: Average Molecular Weights. ("Sur les différentes Moyennes des Grandeurs moléculaires mesurables sur un Echantillon

poly-dispersé.") Ö. Bryde and A. Banderet. *Acta Chem. Scand.*, 1949, **3**, 554-559. The formation of average values of the molecular weights of macromolecules is discussed and a number of different types of these values is presented, especially to show that it is possible to form two different categories of averages of the number-average, weight-average and z-average type.[1] A new terminology is proposed. ([1]Lansing and Kraemer, *J. Textile Institute*, 1935, **26**, A368.) C—**9.**

Polyvinyl Acetate and Derivatives: Molecular Structure and Solubility. A. Dupre. *British Plastics*, 1950, **22**, 89a-98. As determined by osmotic pressure the molecular weights of polyvinyl alcohols originating from polyvinyl acetates of increasing molecular weights do not increase in proportion. This means that as the molecular weight of polyvinyl acetate increases, polyvinyl alcohol must be considered more as a suspension and less as a solution. This has been confirmed by ultra-microscope pictures and by electron micrographs, some of which are shown. Solvents better than water have been found for polyvinyl alcohol and data are given to show how intrinsic viscosity and molecular weight behave in different solvents. The relationship between the reaction constants of solvent and solute, and the intrinsic viscosity is discussed. The intrinsic viscosity and molecular weight of the product obtained by converting polyvinyl alcohol back into the acetate were found to drop considerably. The conclusion is drawn that chains of polyvinyl acetate break on hydrolysis and do not reform on reacetylation, nor do they break further. The effect (on intrinsic and absolute viscosity) of adding glycerol to water to improve its solvent powers for polyvinyl alcohol has also been investigated. A short appendix and four tables of results are given. C—**9.**

Glycine, Alanine and Glycylglycine: Electric Mobilities. Harry Svensson, Allan Benjaminsson and Inger Brattsten. *Acta Chem. Scand.*, 1949, **3**, 307-320. The electric mobilities of glycine, alanine and glycylglycine have been measured in solutions of formic acid, acetic acid and ammonia as functions of *pH*. Apparatus due to Tiselius was employed. The results are used to discuss the possibilities for the electrophoretic separation of amino acids and peptides. Two experiments with mixtures of these substances illustrate, in addition, pronounced and interesting "boundary anomalies" which are easily explained by the moving boundary equation. C—**9.**

Ion-exchange Resins: Properties and Structure; Titration Curves. N. E. Topp and K. W. Pepper. *J. Chem. Soc.*, 1949, December, 3299-3303. The titration curves have been determined for a series of synthetic ion-exchange resins containing known ionisable groups. Sulphonated cross-linked polystyrene is shown to behave as a monofunctional, strong acid; the amount of sodium ion absorbed is independent of *pH*, provided there is a sufficient excess of sodium ion in the solution. Cation exchangers containing carboxyl groups alone or hydroxyl groups alone, behave as weak acids, the uptake of sodium ion being markedly dependent on *pH*. These results provide a basis for the interpretation of the titration curves of polyfunctional exchangers. Thus resins containing both hydroxyl and sulphonic or carboxylic groups give titration curves which consist of segments characteristic of each ionisable group present. C—**9.**

Sarcosine Carbonic Anhydride: Polymerisation Kinetics. S. G. Waley and J. Watson. *Rec. Trav. Chim.*, 1950, **69**, 27-36. The polymerisation of carbonic anhydrides, a reaction important as a preparative method for the synthesis of polypeptides, has been studied in detail on sarcosine carbonic anhydride. The propagation reaction involves a reversibly formed compound between the carbonic anhydride and the polymer. The kinetics of the reaction have been studied and the molecular weight distribution is calculated from the kinetic scheme. C—**9.**

Macromolecules: Sedimentation. ("Sedimentation von Makromolekülen und Durchströmung von Gelen.") R. Signer and H. Egli. *Rec. Trav. Chim.*, 1950, **69**, 45-58. From the sedimentation constants of concentrated solutions of chain molecules and from the Darcy constants of gels consisting of chain molecules, conclusions may be drawn regarding the diameter of the cylindrical particles. The calculation of the diameter is based on the experimental determination of the permeability of geometrically similar, macroscopic systems. Cellulose and gelatin gels show very high dispersion. The permeability of silicic acid gels is considerably greater than that of cellulose or gelatin gels. The sedimentation

velocity of cellulose derivatives, nucleic acid, and polystyrene gives values for the diameter which indicate the presence of isolated chain molecules. The flow through isolated, coiled chain molecules can be related to the flow through gels and to sedimentation at high concentrations. C—**9.**

Particles: Size Analysis; Industrial Applications. C. J. Stairmand. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 77-87. Some experiences in the application of standard methods of particle size analysis for industrial purposes are recorded. The following instruments have been examined: (i) the Andreasen and Werner sedimentation apparatus; (ii) the Roller and Gonell air elutriators; and (iii) the Schöne and Andrews water elutriators. The construction of these is shown diagrammatically and their performances are discussed, *e.g.* in determining the efficiency of a blast furnace gas cleaning system. The use of the optical and electron microscopes is also mentioned. It appears that no one instrument can at present fit all the needs of industry. C—**9.**

Particles: Size Analysis and Standardisation. Harold Heywood. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 14-24. The basic principles employed in particle size analysis are reviewed. Brief descriptions are given of the methods in common use, such as sieving, microscopical measurement, elutriation and sedimentation, including centrifugal separation. Advantages and limitations of the methods are discussed. Definitions of particle size, and the relationship between different measures are discussed in detail. The application of "resolution" to the theory of sedimentation is discussed. Methods of expressing graphically the results of particle size analysis, and of calculating mean diameters are also described. The possibilities of standardising sieving procedure are discussed. C—**9.**

Pigments: Particle Size and Use in Paint. A. C. C. Newman. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 88-93. The influence of particle size in relation to the use of pigments in paints is discussed under the following headings: Range of pigment particle sizes; Shape of pigment particles; Distribution of particle sizes in pigments; The specific surface of pigments; Typical paints in relation to pigment particle size; Opacity and particle size; Inter-packing of pigment particles; Particle shape and paint properties; Thixotropy of paints and particle size and shape; and Future developments. Electron micrographs showing respectively particles of carbon pigment, iron oxide, Prussian blue, graphite, and various forms of zinc oxide are reproduced. C—**9.**

Polymethyl Methacrylate: Particle Size Distribution during Polymerisation. A. F. V. Eriksson. *Acta Chem. Scand.*, 1949, **3**, 1-12. The change in degree of conversion and intrinsic viscosity with time have been studied for the polymerisation of methyl methacrylate in bulk, with benzoyl peroxide as initiator. Distribution and frequency curves have been obtained both at various amounts of initiator and at various degrees of conversion. These curves show several maxima. The influence of various types of cessation reactions on the distribution of molecular sizes is discussed. C—**9.**

Small Suspended Particles: Sedimentation. C. N. Davies. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 25-39. The paper details the physical factors which govern the sedimentation rate of particles roughly below 100 μ which fall slower than 10 cm. per second. It deals with: (1) Types of flow; (2) Spherical solid particles; (3) Bubbles and drops; (4) Non-spherical solid particles; (5) The mutual effect of sedimenting spherical particles; (6) Brownian motion in rotation; (7) Sedimentation and diffusion; and (8) Sedimentation and sampling. There are 22 references to the literature. C—**9.**

Sub-sieve Particle Size Analysis Sedimentation Apparatus. C. J. Stairmand. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 128-134. A simple apparatus for particle size analysis for plant service work is based on the Andreasen sedimentation tube. Defects of previous equipment are briefly mentioned. An illustrated description is given of the new apparatus and its operation. Test results on sand particles and glass spheres are reproduced in tables and graphs. The formulæ which are used to obtain the results are derived mathematically from Stokes's Law. C—**9.**

Electrical Viscometer. A. R. Boyle. *J. Sci. Instruments*, 1950, **27**, 41-43. A simple electrical viscometer has been designed for the instantaneous indication of the viscosities of liquids at any point in an industrial plant. The trans-

mitter unit consists of a two-phase electric motor operated from single-phase mains, so designed that large variations of current in one phase are produced by small changes in viscous drag on the rotating part. The indicator unit is essentially an ammeter in one of the motor phases and is directly calibrated in viscosity units. Models have been designed for operation within pipe lines and containers up to high pressures and high temperatures (about 250° C.) and for the rapid testing of samples. C—**9.**

Fractionated Polystyrene: Viscosity and Diffusion Velocity in Mixed Solvents. ("Étude d'une fraction de polystyrène dans des solvants composés.") G. Vallet. *Rec. Trav. Chim.*, 1950, **69**, 225-235. The viscosity of solutions of a fractionated polystyrene in various toluene-butanol mixtures, and the diffusion velocity of the polystyrene in these solutions have been determined. The results obtained are discussed in the light of current theories. C—**9.**

Polymer Sheets: Flexural Strength and Viscosity Studies; Statistical Treatment. ("Statistical Procedures in Chemical Investigations.") W. L. Gore. *Ind. Eng. Chem.*, 1950, **42**, 320-323. The use of statistical methods in the collection and interpretation of data for chemical investigations is described. Two examples are presented of typical problems encountered in industrial research and pilot plant development where the statistical approach has shed new light on the mechanisms involved. These are (i) flexural strength of an experimental polymer, and (ii) solution viscosity of a linear condensation polymer. C—**9.**

Polymer Solutions: Molecular Size; Viscosity and Precipitation. E. D. Kunst. *Rec. Trav. Chim.*, 1950, **69**, 125-140. The intrinsic viscosities of polystyrene and polyisobutylene fractions and their molecular weights and dimensions have been determined by light scattering. The relations between viscosity and molecular size and between viscosity and molecular weight have been analysed with the help of recent theories of the viscosity of macromolecular solutions. Agreement with theory is only qualitative. The dependence of molecular size on the solvent and temperature, and also on molecular weight have been studied, and results are reported and discussed. The preferential adsorption of solvent in a solvent-precipitant mixture is also discussed. C—**9.**

Polymethacrylic Acid: Dissociation and Specific Viscosity. R. Arnold and J. Th. G. Overbeek. *Rec. Trav. Chim.*, 1950, **69**, 192-206. Solutions of polymethacrylic acid have been partially neutralised to different extents, and the *pH* values and viscosities of the resulting solutions determined. These measurements were carried out at different potassium chloride concentrations and on several polymer samples. The calculated dissociation constants of the polymer acid were substituted in an equation expressing the change in dissociation constant of a polybasic acid as a function of the radius of the molecular coil and of the charge on the molecule.[1] The derivation of this equation treats the polymer molecule as a sphere containing a continuous charge. The radii found are of the right order and change in the expected way with changing ionic strength and ionisation. Substitution of these radii in the Debye[2] viscosity equation gives satisfactory agreement between observed and experimental viscosities at low degrees of ionisation. At higher degrees of dissociation it would seem that the treatment of the polymer coil as a sphere is no longer satisfactory, although a better approximation is obtained if the charge is considered to be entirely on the surface of the sphere. ([1]*J. Textile Institute*, 1949, **40**, A40; [2]1947, **38**, A80.) C—**9.**

Analytical Raman Spectroscopy: Developments. W. G. Braun and M. R. Fenske. *Anal. Chem.*, 1950, **22**, 11-14. A review is given of developments in analytical Raman spectroscopy during 1949 under the headings: Apparatus; Analytical procedures; Applications; Collections of spectra; Structural studies; and Crystal structure. There are 101 references to the literature. C—**9.**

Cellulose and Derivatives: Infra-red Absorption Spectra. V. N. Nikitin. *Zhur. Fiz. Khim.*, 1949, **23**, 775-785, 786-789 (through *Chem. Abstr.*, 1950, **43**, 8886[b], 8887[c]). (1) Cellulosic fibres, cellulose nitrate, dinitrate, acetate and "hydrate" (mercerised), ethylcellulose and sucrose were immersed in carbon tetrachloride-carbon disulphide mixtures having $n = 1{\cdot}57$, and their infra-red absorption was measured between 1 and 2·5 μ. Ramie and cotton nitrated to 3·12 per cent. N display absorption bands at 1·44 μ; the intensity increases with N content. Nitrocellulose of 13·7 per cent. N does not show a band at 1·44 μ;

all its OH groups are nitrated. On the other hand, cellulose and mercerised cellulose do not display a band at 1·44 μ, because all the OH groups are disturbed by H-bonds. Ramie has bands at 1·49, 1·54, 1·58, 1·94 and 2·11 μ and cotton has a broad band at 1·5-1·6 μ, in addition to those at 1·94 and 2·11 μ. Crystalline sucrose has bands at 1·44, 1·51 and 1·58 μ, whilst molten and solidified sucrose has a broad band near 1·48 μ, instead of the 1·44 and 1·51 bands. Films of cellulose dinitrate and cellulose acetate have bands at 1·44-1·45 and 1·91-1·92 μ belonging to free OH. Hydrolysis leads to "cellulose hydrate" with the same spectrum as mercerised cellulose. Ethyl alcohol dissolved in carbon tetrachloride, but not alone, displays a sharp band at 1·44 μ. (2) The sharp band at 1·435 μ displayed by cellulose dinitrate films loses about half of its intensity when the film is dissolved in a 1 : 3-mixture of alcohol and ether. The band disappears completely when the film is dissolved in acetone. C—**9.**

Peptide Linkage: Absorption of Ultra-violet Energy. A. D. McLaren. *Acta Chem. Scand.*, 1949, **3**, 648. In order to ascertain whether or not the peptide linkage displays a characteristic absorption band for ultra-violet radiation (at 2,800 Å), the ultra-violet absorption spectrum of clupein has been studied. This compound is a polypeptide lacking aromatic amino acid residues. Absorption curves for a solution of clupein of fixed concentration at three different *pH* values are shown. The data indicate that there is no specific absorption of peptide bonds at 2,800 Å and confirm the fact that no aromatic amino acids are present in clupein. C—**9.**

Potato Starch: Aerobic Photo-degradation. ("Some Morphological Features Accompanying the Aerobic Photo-degradation of Whole Potato Starch.") Frank Baker and W. J. Whelan. *Nature*, 1950, **165**, 449-450. When potato starch irradiated in ultra-violet light was mounted in a non-aqueous medium such as anisole, microscopic examination showed that the majority of the granules still retained their birefringence. If examined at room temperature in water, iodine solution or other aqueous reagents, the granules swelled almost immediately and lost their birefringence. These changes were accompanied by the separation of clearly defined surface membranes and by solubilisation of the contents of the granule. These and other morphological changes became more prominent when chloral hydrate was used as swelling agent. Attention is drawn to several points to be considered in assessing the significance of these facts. C—**9.**

Particles: Size Estimation by the Light-extinction Method. D. G. Skinner and S. Boas-Traube. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 57-63. The light-extinction method of particle size determination is discussed. Assumptions made in the interpretation of light extinction data are examined and compared with experimental facts. The applicability of the Lambert-Beer law is discussed. The photo-electric turbidimeter is briefly described and data are given on the relation between turbidity and particle concentration, turbidity and length of light path, and on the extinction coefficient. C—**9.**

Schlieren Apparatus Employing Multiple Slit-gratings. T. A. Mortensen. *Rev. Sci. Instruments*, 1950, **21**, 3-6. A schlieren apparatus is described and illustrated, in which the conventional knife-edge elements are replaced by multiple slit-gratings. The main advantage is that larger working fields can be achieved with an objective lens of given aperture. Also, in some cases, greater intensity of image illumination is obtained, and usually the over-all length of the system is reduced. C—**9.**

Physical Concepts: Designation. ("A Modern Approach to 'Dimensions'".) Parry Moon and Domina E. Spencer. *J. Franklin Inst.*, 1949, **248**, 495-521. An investigation of some possible "dimensional" systems for the designation of physical concepts is described. The usual system based on the primary concepts of length, mass, and time, results in a large number of ambiguities. On replacing the usual length l by two fundamental lengths, l_r and l_t (radial and tangential), symbols are obtained for the concepts of energy and torque, for normal stress and shear stress, and for pharosage (radiant energy per unit area) and helios (brightness). Examples are given of the use of the new system in checking equations and in deriving new equations. An alternative system is also outlined which employs the fundamental lengths l_r, l_t and l and discriminates between vectors and scalars in physical space. Eleven tables of concepts, symbols, base vectors, *etc.*, are given. C—**9.**

Particles: Size Measurement by Electron Microscopy. W. H. Walton. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 64-76. The construction and characteristics of the electron microscope are outlined and factors which have a bearing on its use in particle size determination are indicated. The preparation of specimens from dry powders, suspensions in liquids and airborne clouds is described. Various surface replicas which may be used in order to view the specimen by transmission are mentioned and the use of shadow-casting techniques is explained. The measurement of the height of objects seen in the electron microscope by stereoscopic and by shadow-casting methods is also mentioned. Statistical considerations in particle counting are briefly discussed. Achievements of electron microscopy in the field of particle size measurement are surveyed, and finally comment is made on the future of this means of investigation. There are 58 references to the literature. A full discussion of the paper is reported, in which some properties of a finely divided solid, types of error involved in particle size determinations, and other relevant points are considered. C—9.

Powders: Fineness Measurement by Permeability Methods. F. M. Lea and R. W. Nurse. *Trans. Inst. Chem. Eng.* (London), 1947, **25**, *Supplement*, 47-56. The theory of the derivation of the specific surface of a powder from permeability data on the compacted material is reviewed. Equations are derived for streamline viscous flow, for molecular diffusion and for a combination of these. Experimental data are given showing that the simple theory holds only for spherical particles; for non-spherical particles the calculated specific surface is not independent of the porosity of the compacted powder bed. Various corrections for this effect are discussed; none of them is entirely satisfactory. A comparison is made between specific surface as estimated from permeability data and nitrogen adsorption data. A few light absorption results are also given. Some examples of the practical applications of the permeability method are cited. C—9.

Electron Microscope Electromagnetic Focussing Device. H. T. Meryman. *Rev. Sci. Instruments*, 1949, **20**, 955. The construction of an electromagnetic focussing device for the electron microscope is briefly described and illustrated. The device, by increasing the angular aperture of illumination, decreases the depth of the field and increases the sensitivity of focussing. Such increase in focussing sensitivity is particularly valuable at low intensities and in low-contrast biological specimens. C—9.

Surface Temperature: Measurement. Nabuji Sasaki. *Rev. Sci. Instruments*, 1950, **21**, 1-3. A new method for the measurement of surface temperature makes use of a thermocouple whose measuring junction can be adjusted to any temperature. The temperature of the junction indicated by a millivoltmeter in the couple circuit is also the temperature of the surface, if the junction temperature has been so adjusted that the needle of the meter shows no deflection, when the junction makes a light brief contact with the surface. The validity of the principle is confirmed by measuring a surface whose true temperature is known independently. The method can give the correct surface temperature even when radiation comes from above or below. C—9.

Temperature Measurement Instruments: Dynamic Accuracy. J. G. Ziegler and N. B. Nichols. *Instruments*, 1950, **23**, 66-69. The dynamic accuracy obtainable in temperature measurement is discussed. An illustrated description is given of the design and operation of a temperature transmitter with dynamic compensation for thermal lag. The use of this instrument makes possible a degree of speed and accuracy not previously obtainable. C—9.

Macromolecular Solutions: Acoustic Birefringence. ("La biréfringence acoustique des solutions macromoléculaires.") Anton Peterlin. *Rec. Trav. Chim.*, 1950, **69**, 14-21. A macromolecular solution becomes birefringent under the influence of ultrasonic waves. A theory of the effect is developed for the model of the permeable statistical coil and the partial "immobilisation" of the solvent. The birefringence is proportional to the square root of the intensity of the acoustic wave, to the frequency of the wave and to the dynamic birefringence of the solution. If the phenomena of relaxation are also considered, the acoustic birefringence gives the same information about the macromolecule in solution as does the streaming birefringence. C—9.

Flat Spiral Springs: Elastic Stability. J. A. Haringx. *Appl. Sci. Res.*, 1949, A2, 9-30. The elastic stability of the flat spiral spring is discussed. A rough calculation valid for springs having a large number of coils shows that the critical number of turns which the spring has to be wound or unwound to reach the state of instability is determined only by the ratio of the sides of the rectangular wire section. It depends neither upon the number of coils nor upon Young's modulus of the wire material. In order to verify how this holds for a spring with a small number of coils, a second and more accurate calculation is given, though for a (fictitious) spiral spring having circular and identical coils only. Further, it is shown that the realisation of a spiral spring able to undergo more than, say, three turns without becoming unstable is impossible. A survey of the results is given. **C—9.**

10—ECONOMICS

American Cotton Spinning Mills: Productivity. Anglo-American Council on Productivity. *Textile Weekly*, 1950, **45**, 662; *Textile Mercury & Argus*, 1950, **122**, 419-425, 450. Summaries are given of a report of a visit in 1949 to American cotton mills by a British "productivity team". Average British and American figures for Operative Hours per Unit of Production (OHP) are tabulated for card and ring room processes and reasons are advanced for the higher productivity in the United States. One handicap in Britain is said to be the lack of freedom to purchase the best grades of cotton. **C—10.**

American Oilcloth Industry: Development. ("The History of Standard Coated.") C. R. Bragdon. *Interchem. Rev.*, 1949, **8**, No. 1, 18-29. An historical survey is presented of the oilcloth producing industry in the United States. The development of each of the seven firms which were consolidated in 1901 to form the Standard Table Oil Cloth Co., is traced. In 1937 this company became allied with the Interchemical Corporation and now has the world's largest oilcloth factory. **C—10.**

Cotton Textile Products: Development. J. F. Hagen. *Papers Amer. Assoc. Textile Technologists*, 1949, **4**, 144-148. The background of the cotton industry in America is surveyed and the effect of the rise of the artificial fibres is noted. Rayon has decreased in price but cotton has increased. Reference is made to the report on cotton and its uses issued by the National Cotton Council at Memphis. Research in the field of cotton technology is discussed and it is stated that in the U.S.A. research expenditure for cotton has been less than 10 per cent. of that expended by the rayon industry. Some projects for research are mentioned and many ways in which cotton could be improved are suggested. **C—10.**

Textile Wholesale Prices, February, 1950. ("Wholesale Price Index Numbers.") *Board of Trade J.*, 1950, **158**, 490-491. The index numbers for February, 1950, are: Cotton 306·9; Wool 387·6; Other textiles 185·0; All articles 245·2. Increases in raw cotton prices caused an increase in the group index of 1·3 per cent. as compared with January. **C—10.**

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY AND EDUCATION

Industrial Disease in the Cotton Industry. R. Murray. *Textile Weekly*, 1950, **45**, 794-802. A report of a lecture and discussion on "byssinosis" of card-room operatives, mule spinners' cancer and minor ailments encountered among cotton workers, with reference to research work in progress on their prevention. **C—11.**

Textilforsknigsinstitutet, Gothenburg, Sweden. ("Wool Research Institutions throughout the World.") *Wool Sci. Rev.*, 1949, No. 4, 16-24. A brief illustrated description is given of the development of the Swedish Textile Research Institute at Gothenburg and its work in the field of wool research is outlined. **C—11.**